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WATER QUALITY BRANCH ACTIVITIES
1986-1987

ACTIVITES DE LA DIRECTION DE LA QUALITE
DES EAUX 1986-1987

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TEXTE PROVISOIRE

A. SUMMARY

This report documents the Water Quality Branch's plans for water quality assessments, laboratory operations, water quality objectives and other activities for the fiscal year 1986-87.

The publication provides details of the Water Quality Branch headquarters and regional programs and their respective projects. The details include: goals and rationale, brief project description, station locations, frequency of sampling and parameters measured, person-years and financial resources required.

The document has been compiled from the 86/87 project sheets, which were prepared prior to the beginning of the fiscal year, and consequently does not contain any projects initiated since then. Major omissions are not expected however, and the projects were on schedule at printing time in August 1986. A comparison of Table 1, with Tables 3 - 5 reveals discrepancies between various numbers. The figures of Table 1, provided by the IWD-Administration, represent the actual resources allocated to the WQB as of April 1986. Tables 3-5, as mentioned above, were compiled from planning papers.

The document is for internal use by the WQB and it provides a record of the Water Quality Branch programs and projects. It should also provide useful information for senior management.

2. RESUME

Le présent rapport énonce les travaux de laboratoire, les activités en matière de surveillance et d'objectifs de qualité de l'eaux et les autres opérations que la Direction de la qualité des eaux se propose d'effectuer au cours de l'année financière 1986-87.

Le présent rapport décrit les programmes et les projets des bureaux régionaux et de l'administration centrale de la Direction de la qualité des eaux. Les détails comprennent les objectifs et leur justification, de brèves descriptions des projets, l'emplacement des stations, la fréquence des échantillonnages, les paramètres mesures et les ressources humaines et financières nécessaires.

Ce document a été établi à partir des fiches de projets pour 1986-87, lesquelles ont été rédigées avant le début de l'année financière; par conséquent, il ne donne aucun renseignement sur les projets qui ont été élaborés au cours de l'année financière. La majorité des projets y sont énumérés cependant, et aucun projet n'était en retard au moment de l'impression, soit en août 1986. Une comparaison entre le Tableau 1 et les tableaux 3 à 5 démontre certaines différences. Ces dernières s'expliquent du fait que les données du Tableau 1, qui ont été fournies par l'administration centrale de la Direction générale des eaux intérieures, représentent les ressources réelles qui avaient été accordées à la Direction de la qualité des eaux en avril 1986, tandis que les tableaux 3 à 5 ont été établis à partir des fiches de projects.

Le document n'est destiné qu'à la Direction de la qualité des eaux. Il constitue un inventaire des programmes et projets de cette direction. Il devrait en outre se révéler utile aux cadres supérieurs à titre d'information.

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B. INTRODUCTION

B.1 Inland Waters Directorate

The Inland Waters Directorate (IWD) has the prime federal responsibility for monitoring freshwater resources in Canada, as well as other responsibilities. The Directorate's work, is carried out by three operational branches - Water Quality, Water Resources, and Water Planning and Management, and the Research Coordination and Program Evaluation Branch at headquarters, and five regional components across Canada. Two institutes - the National Hydrology Research Centre (NHRC), in Saskatoon, and the National Water Research Institute (NWRI), Burlington, comprise the main research components of the Directorate.

B.2 Purpose of the Water Quality Branch

Within IWD, the purpose of the Water Quality Branch (WQB) is to promote the conservation and enhancement of the quality of Canada's inland water resources for the economic and social benefit of Canadians by providing scientific and technical information and advice on water quality.

Additional information of the purpose, role and activities of the Branch can be found in the "Business of the Water Quality Branch", an Inland Waters Directorate publication, (Ottawa, 1985).

B.3 Role of the Water Quality Branch

The role of Water Quality Branch is:

1. To provide scientific and technical information and advice to government, private agencies and the public, and to promote the wise management of the quality of waters:
    a) shared by Canada and the United States, and by one or more provinces and/or territories;
    b) on federal lands, such as national parks, Indian reserves, heritage canals; and other properties and facilities where water resource management is primarily a federal responsibility;
    c) where there is federal responsibility, such as for fisheries and wildlife;
    d) subject to impact by federally funded projects.
2. To detect emerging water quality problems and to evaluate water quality issues concerning Canada's inland waters from regional and national point of view.

The Branch's role is operational. Research and related support services are provided by the research institutes, NWRI and NHRC. The Branch in turn provides operational support to both institutes.

B.4 The Structure of the Water Quality Branch

The Water Quality Branch comprises an interdisciplinary team of chemists, biologists, geologists, hydrologists, geographers, meteorologists, technicians, computer scientists, clerks and secretaries, each of whom fills a specialized role in the complex undertaking of measuring and assessing water quality.

The branch is decentralized with Headquarters in the National Capital Region and regional offices in Moncton, N.B. (Atlantic region); Longueuil, Que. (Quebec Region); Burlington, Ont. (Ontario Region); Regina, Sask. (Western and Northern Region); and Vancouver, B.C. (Pacific and Yukon Region). The Western and Northern Region also has district offices located in Winnipeg, Manitoba, and Calgary, Alberta, and a water quality specialist located in Yellowknife, NWT. (See Figure B1 for a branch organization chart).

Administratively, the headquarters and regional components function under different lines of authority, with the Headquarters group reporting through the Water Quality Branch Director and the regional offices reporting through their respective Regional Director to the Director General, Inland Waters Directorate, or to a Regioanl Executive Director under the new organization now being implemented in the Conservation and Protection Service.

B.5 Headquarters and Regional Roles

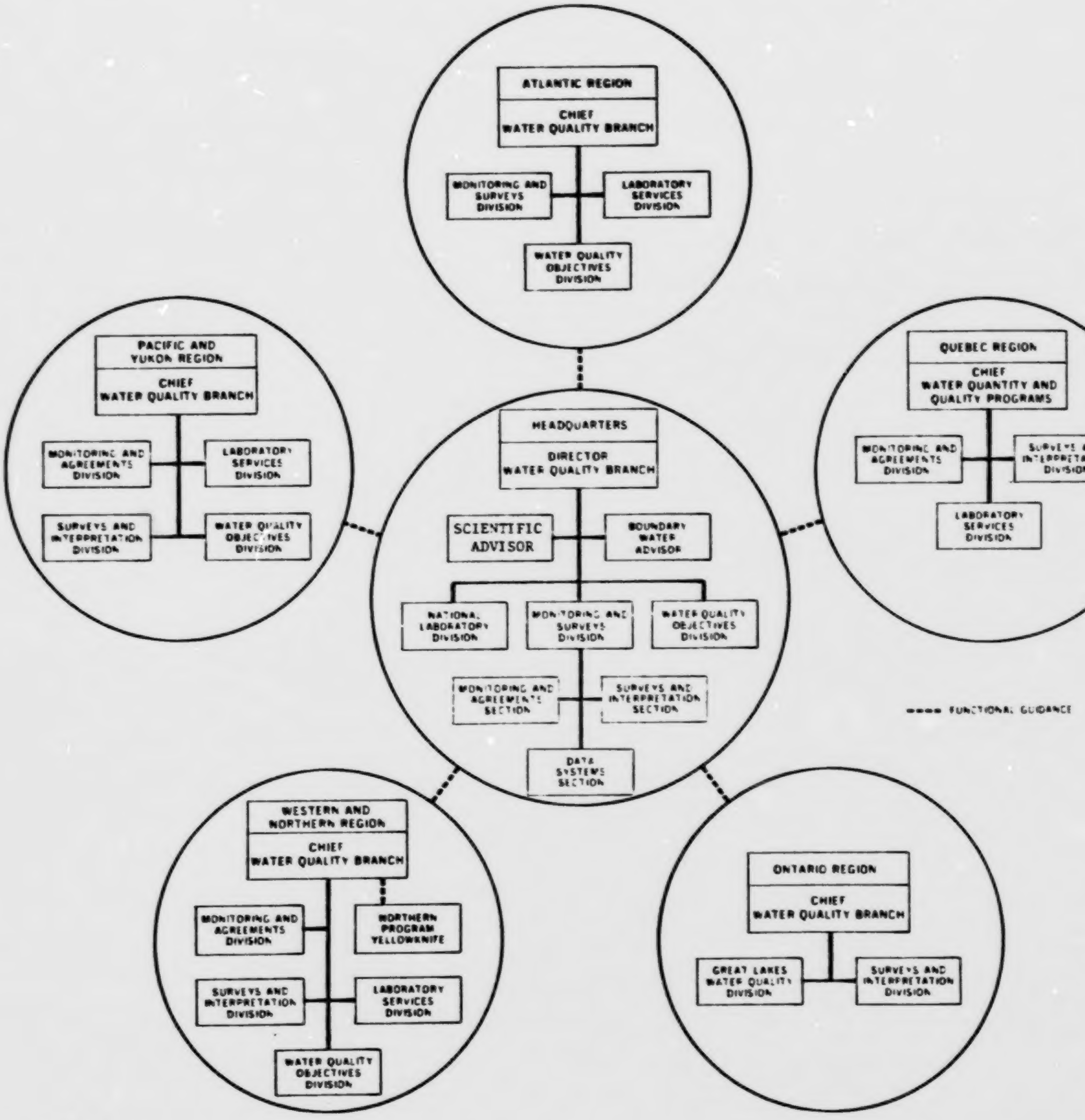
The headquarters and the regional offices share the responsibility for delivering an effective and efficient federal water quality program. Figure B2 shows the major responsibilities and linkages of the regional offices, headquarters and the national laboratory.

Headquarters is responsible for coordinating water quality programs to meet national requirements. It also formulates national policies and provides guidance in the development of the operational plans, establishes national goals and priorities, prepares nationally focussed water quality reports, and provides information and advice on water quality. The regional offices are responsible for planning, designing and implementing water quality programs and for providing water quality information and advice.

Both headquarters and the regional offices share the responsibility for identifying research needs relevant to achieving branch objectives. Operational contacts are appointed to liaise with researchers in both government and private sectors. In this way, the Branch influences the direction of research undertaken by the two national research institutes and transfers research results to the operational program.

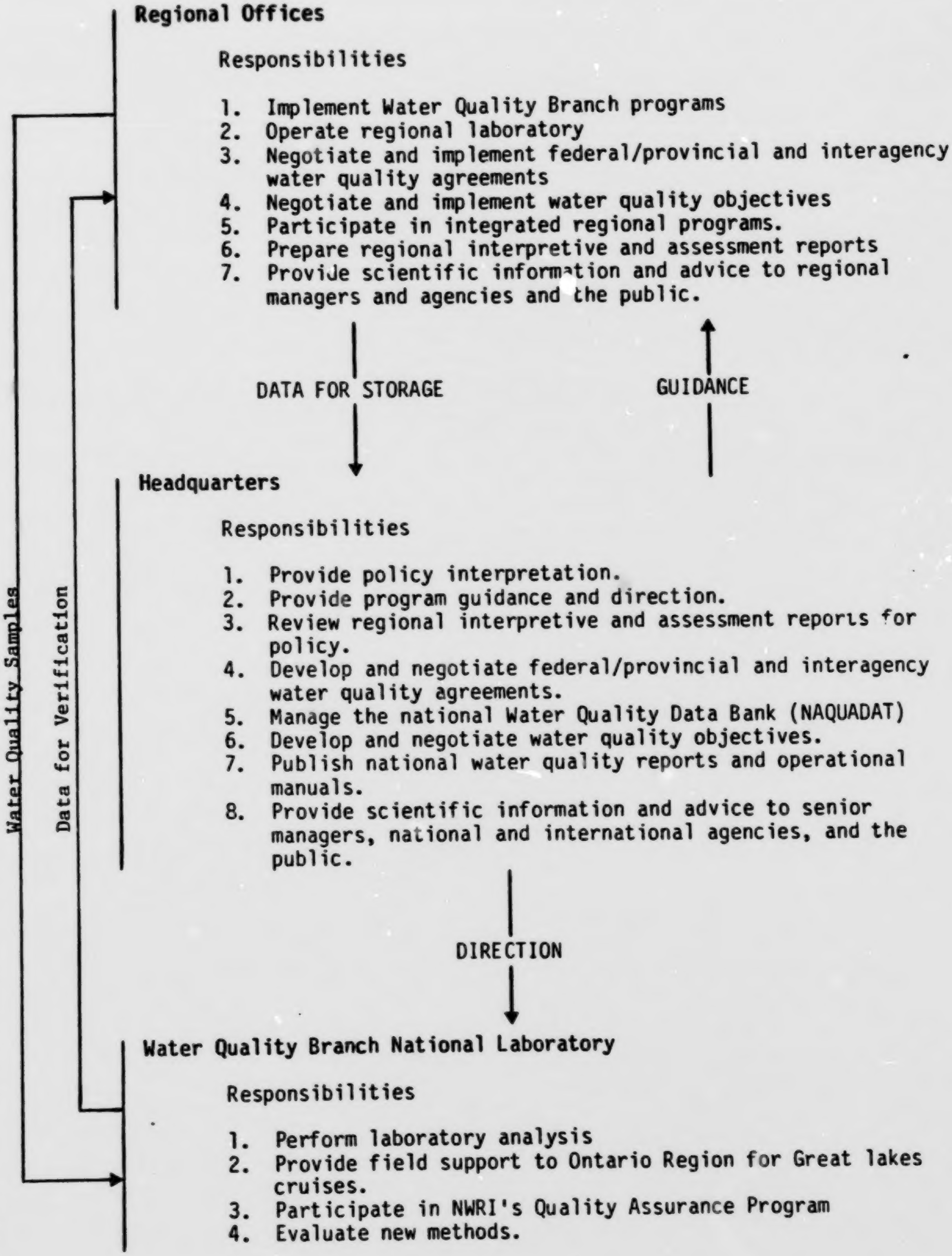
Headquarters is also responsible for the National Water Quality Data Bank (NAQUADAT), a computerized data storage and retrieval system, operated and maintained by the Water Quality Branch. NAQUADAT contains data from some 5000 locations in Canada. The system stores the results of environmental analyses and other data about the samples and sampling locations, and produces a large variety of graphical and statistical reports.

FIGURE B1: SCHEMATIC ORGANIZATION OF THE HEADQUARTERS AND THE REGIONAL OFFICES OF THE WATER QUALITY BRANCH (WQB)


ATLANTIC REGION
CHIEF WATER QUALITY BRANCH
MONITORING AND SURVEYS DIVISION
LABORATORY SERVICES DIVISION
WATER QUALITY OBJECTIVES DIVISION
PACIFIC AND YUKON REGION
CHIEF WATER QUALITY BRANCH
MONITORING AND AGREEMENTS DIVISION
LABORATORY SERVICES DIVISION
SURVEYS AND INTERPRETATION DIVISION
WATER QUALITY OBJECTIVES DIVISION
QUEBEC REGION
CHIEF WATER QUANTITY AND QUALITY PROGRAMS
MONITORING AND AGREEMENTS DIVISION
SURVEYS AND INTERPRETATION DIVISION
LABORATORY SERVICES DIVISION
HEADQUARTERS
DIRECTOR WATER QUALITY BRANCH
SCIENTIFIC ADVISOR
BOUNDARY WATER ADVISOR
NATIONAL LABORATORY DIVISION
MONITORING AND SURVEYS DIVISION
WATER QUALITY OBJECTIVES DIVISION
MONITORING AND AGREEMENTS SECTION
SURVEYS AND INTERPRETATION SECTION
DATA SYSTEMS SECTION
FUNCTIONAL GUIDANCE
WESTERN AND NORTHERN REGION
CHIEF WATER QUALITY BRANCH
MONITORING AND AGREEMENTS DIVISION
NORTHERN PROGRAM YELLOWKNIFE
SURVEYS AND INTERPRETATION DIVISION
LABORATORY SERVICES DIVISION
WATER QUALITY OBJECTIVES DIVISION
ONTARIO REGION
CHIEF WATER QUALITY BRANCH
GREAT LAKES WATER QUALITY DIVISION
SURVEYS AND INTERPRETATION DIVISION

* FIVE REGIONAL OFFICES LOCATED IN VANCOUVER, REGINA (CALGARY, SASKATOON AND WINNIPEG), BURLINGTON, LONGUEUIL AND MONCTON.

Figure B.2: Responsibilities within the Water Quality Branch



Regional Offices

Responsibilities

1. Implement Water Quality Branch programs
2. Operate regional laboratory
3. Negotiate and implement federal/provincial and interagency water quality agreements
4. Negotiate and implement water quality objectives
5. Participate in integrated regional programs.
6. Prepare regional interpretive and assessment reports
7. Provide scientific information and advice to regional managers and agencies and the public.

Headquarters

Responsibilities

1. Provide policy interpretation.
2. Provide program guidance and direction.
3. Review regional interpretive and assessment reports for policy.
4. Develop and negotiate federal/provincial and interagency water quality agreements.
5. Manage the national Water Quality Data Bank (NAQUADAT)
6. Develop and negotiate water quality objectives.
7. Publish national water quality reports and operational manuals.
8. Provide scientific information and advice to senior managers, national and international agencies, and the public.

Water Quality Branch National Laboratory

Responsibilities

1. Perform laboratory analysis
2. Provide field support to Ontario Region for Great lakes cruises.
3. Participate in NWRI's Quality Assurance Program
4. Evaluate new methods.

B.5.1 Divisional Responsibilities

The Branch, at headquarters and in the regions, has three divisions briefly described below.

B.5.2 Monitoring and Surveys Division

This Division is responsible for the measurement and assessment activities of the branch including planning of projects, collection of samples, interpretation of data and preparation of reports. Much of this work is integrated with provincial program through the negotiation of formal Federal-Provincial Water Quality Agreements

The Division also develops policies, negotiates water quality monitoring agreements and provides information and advice for the management of water resources.

B.5.3 National Water Quality Laboratory

Located in the Canadian Center for Inland Waters (CCIW) in Burlington, Ontario, the National Laboratory is responsible for providing water quality data by analyzing environmental samples sent in by the branch's regional offices located in Burlington, Moncton, Longueuil, Regina and Vancouver as well as other government agencies. Staff provide an advisory and consultative service to senior officials, scientists and researchers in the Department, other departments and agencies on analytical chemistry, laboratory operations, water chemistry and data interpretation. The National Laboratory maintains the "Analytical Methods Manual" which documents the approved methods and techniques used by analysts in the branch laboratories and many other federal, provincial and private laboratories.

B.5.4 Water Quality Objectives Division

The Water Quality Objectives Division provides the Branch with the expertise for formulating and applying water quality objectives for the management of Canada's inland waters, and for evaluating their effectiveness. An important component in their activities is the provision of information on the effects of various pollutants on water uses.

In 1986/87, the Division, (headquarters, assisted by the regional offices), will complete its commitment to the Canadian Council of Resource and Environment Ministers Task Force on Water Quality Guidelines by preparing the "Canadian Water Quality Guidelines". The Guidelines, prepared in cooperation with the federal Departments of Health and Welfare, Fisheries and Oceans, Agriculture and

Regional Industrial Expansion, will provide scientific and technical information on a number of water quality parameters and water quality uses for Canadian conditions.

Work will continue, both at headquarters and in the regional offices, in developing the water quality objectives approach to water resource management for international and interprovincial waters and for waters on federal lands. The formulation of water quality objectives is scheduled for the Ottawa and Souris Rivers. Revision of water quality objectives previously established is planned for the St. Croix, Rainy and Red Rivers. Water quality data and criteria information are being developed for the formulation of water quality objectives for the Flathead, Fraser River Istuary and Similkameen Rivers.

B.6 Federal/Provincial Water Quality Agreements

In January 1982, Environment Canada obtained Cabinet approval to negotiate agreements with the provinces for the collection of water quality data and information. These agreements will provide for long-term commitments and compatible data bases, accurate and comprehensive information and improved federal-provincial relations, as well as significant improvements in the efficiency and effectiveness of WQB's program.

The first agreement with the province of Québec was signed in May 1984. Agreements were also signed with the provinces of Newfoundland (April 1986) and British Columbia (October 1985). Negotiations with Manitoba and New Brunswick have reached their final phase. Negotiations will be initiated with the remaining provinces and territories during the course of the year.

The river basin concept is the basic approach used for the planning of water quality activities covered by a given agreement (Water Quality Branch Stategy for the Assessments of Environmental Quality, 1986). Governments cooperatively identify water quality issues of concern. Then the most representative basins related to these issues are chosen. For stations of interest to both federal and provincial governments the cost of data collection is shared.

The agreements include joint planning and data interpretation, regular exchange of information; and compatible sampling, analytical and quality assurance protocols. Station operation varies from one agreement to another. In the Quebec agreement, the federal-provincial stations are operated by the province. In the draft Alberta agreement, all stations, including the provincial, are operated by the federal government. Newfoundland and British Columbia Agreements are based in the work-sharing principle.

B.7 Resources

In order to conduct its activities the Branch has a budget (1986-87) of approximately 9.3 million and 157 person-years plus some additional, non A-base resources. Part of this budget is committed to analytical support of the departmental research programs. More detailed breakdowns of these resources are shown in Tables 1-5.

B.8 Objectives of the C&P National Program to Which WQB Contributes

1.1 Canada - U.S. and Interjurisdictional Water Management

To resolve interjurisdictional water resource problems and realize interjurisdictional water resource opportunities in accordance with national interests.

1.3 Water Quality Management Data

To provide comprehensive, accurate and timely data, information and advice on the quality of Canada's inland waters.

1.5 Water Management Research

To advance knowledge and provide information and understanding required for the solution of water management problems and the realization of water development opportunities.

1.6 Management and Administration

To plan, manage and control the policies, programs and activities of the Inland Water Directorate in an effective and efficient manner.

4.1 Toxic Chemicals

To provide information on the characteristics and presence of toxic chemicals in the environment, the pathways of these chemicals through ecosystems, and knowledge of their actual and potential impacts on the environment.

4.2 Long-Range Transport of Airborne Pollutants (LRTAP)

To monitor, predict and evaluate impacts of airborne pollutants on aquatic and terrestrial ecosystems.

4.3 Environmental Assessment and Baseline Studies

To participate effectively in the Environmental Assessment and Review Process and to provide environmental knowledge and predictive capability which will ensure that federal decisions on major development proposals reflect environmental and renewable resource concerns.

Each project description of Chapter D shows the national program to which the project contributes.

C SUMMARY OF RESOURCES (TABLES)

Table 1
Water Quality Branch
Allocation of Resources 1986-87 ($'000)

	H.Q.								Total	Total
Item	PVM.	Lab.	Atl.	Que.	Ont.	W&N	NWT	P&Y	Allocation	Estimated
Person-Years										
A-base	28.75	43.0	27.0	9.5	12.4	23.0	1.46	19.0	164.11	163.12
non A-base					2.0	1.76			3.76	4.76
Salaries										
A-base	1395.2	1290.0	969.7	388.4	533.6	863.0	58.1	786.9	6284.9	6259.47
non A-base						62.2			62.2	137.16
Operating										
A-base	310.0	387.15	198.0	148.5	124.9	561.0	122.1	355.0	2206.65	2342.72
non A-base	427.0	3.0	100.0	80.0	230.0	77.3			917.3	667.33
Capital										
A-base	50.0	171.5	95.0	48.0	23.6	107.0	2.3	80.0	577.4	621.22
non A-base			15.0		117.0	17.3			149.3	72.32
Grants & Contrib.	-	-	-	197.0	-	-	-	-	197.0	197.0
TOTAL										
A-base	1755.2	1848.65	1262.7	781.9	682.1	1531.0	182.5	1221.9	9265.95	9420.11
non A-base	427.0	3.0	115.0	80.0	347.0	156.8			1128.8	876.81

NOTE: This table shows the resources allocated to the W.Q.B's units at the start of the fiscal year. The last column totals show the estimated resources. Differences are due to early estimates and resource shifts during the year. The tables which follow are based on estimated resources.

Table 2
Summary of Stations in Water Quality Branch Programs 1986-87

C&P Programs/ WQB Projects	NFLD &LAB	PEI	NS	NB	QUE	ONT	MAN	SASK	ALTA	NWT	BC	YUK	TOTAL
1.1 CAN-US & INTERJURISDICTIONAL WATERS													
International				18		7	4	7	6		5		47
Great Lakes						281							281
Interprovincial							4			2			6
Atmospheric Precip.						15							15
Prairie Prov. Water Board							1	6	4				11
Water Quality Objectives							(1)	(1)	1(2)				1(4)
Other							3			3			6
Subtotal				18		303	12(1)	13(1)	11(2)	5	5		367(4)
1.3 WATER QUALITY MANAGEMENT DATA													
International				(3)							13	1	14(3)
Interprovincial											2	3	5
G.E.M.S.				(1)	(1)	(1)	(2)			(2)	(1)		(8)
Atl. Region Overview	8	3	7	6(4)									24(4)
W&N Adhoc Agreements								5	12				17
Nat. Parks Agreement									5	1			6
Other						3	(7)	2(2)		16	2		23(9)
Monitoring Agreements													
Federal					81								81
Fed/Prov. (cost shared)					312						21(2)		333(2)
*Provincial					40**						50**		90**
Subtotal	8	3	7	6(8)	393(1)	3(1)	(9)	7(2)	17	17(2)	38(3)	4	503(26)
4.1 TOXIC CHEMICALS													
Radionuclides	1		1(1)	2(1)			(3)	(1)		(1)			4(7)
Organics in Precip.		1	2			4							7
Toxic Chemicals						9(1)							9(1)
Subtotal	1	1	3(1)	2(1)		13(1)	(3)	(1)		(1)			20(8)
4.2 LONG RANGE TRANSPORT OF AIRBORNE POLLUTANTS													
LRTAP Monitoring	38(8)		70(2)	4	39								151(10)
Subtotal	38(8)		70(2)	4	39								151(10)
TOTAL FEDERAL	47	4	80	30	120	319	12	20	28	22	22	4	708
TOTAL FED./PROV.					312						21		333
TOTAL FED.& FED./PROV.	47	4	80	30	432	319	12	20	28	22	43	4	1041
TOTAL PROVINCIAL*					40						50		90*
GRAND TOTAL	47	4	80	30	472	319	12	20	28	22	93	4	1131

"( )" Denotes stations that have been accounted for in other program numbers
* Data from Provincial stations are available to DOE as required.
** Not added here - but included below in grand total.

Table 3
Water Quality Branch Summary of Resources
by Region for C&P National Programs - 1986-87 (estimated)

Region / C&P National Program	Person Years	Financial Resources ($'000)				
		Salaries	O&M	Grants & Contrib.	Capital	Total
Headquarters - PVM						
1.1 Canada-US & Interjurisdictional Water Management	2.8	137.1	12.0	-	-	149.1
1.3 Water Quality Management Data	10.5	460.0	130.0	-	30.0	620.0
			(407.0)			(407.0)
1.6 Management & Adm	4.6	322.0*	77.0	-	5.0	404.0*
4.1 Toxic Chemicals	9.35	411.1	81.0	-	15.0	507.1
4.2 L.R.T.A.P.	1.5	65.0	10.0	-	-	75.0
			(20.0)			(20.0)
Subtotal	28.75	1395.2*	310.0	-	50.0	1755.2*
						(427.0)
Headquarters - National Laboratory						
1.3 Water Quality Management Data	31.0	930.0	270.0	-	136.5	1336.5
			(3.0)			(3.0)
4.1 Toxic Chemicals	12.0	360.0	117.15	-	35.0	512.15
Subtotal	43.0	1290.0	387.15	-	171.5	1848.65
						(3.0)
Headquarters Total	71.75	2685.2*	697.15	-	221.5	3603.85*
						(430.0)
Atlantic						
1.1 Canada-US & Interjurisdictional Water Management	5.6	199.0	56.0	-	10.0	265.0
1.3 Water Quality Management Data	4.4	162.0	42.0	-	15.0	219.0
4.1 Toxic Chemicals	9.7	352.0	70.8	-	45.0	467.8
4.2 L.R.T.A.P.	7.3	257.0	29.0	-	25.0	311.0
			(100.0)		(15.0)	(115.0)
Total	27.0	970.0	197.8	-	95.0	1262.8
						(115.0)
Quebec						
1.3 Water Quality Management Data	6.3	240.4	70.0	197.0	41.5	548.9
4.1 Toxic Chemicals	3.2	148.0	122.5	-	6.5	277.0
4.2 L.R.T.A.P.	-	-	80.0	-	-	80.0
Total	9.5	388.4	272.5	197.0	48.0	905.9

"( )" Represents additional non A-base Resources * Includes 138.6 K salary reserve

Table 3 (cont'd)
Water Quality Branch Summary of Resources by Region for C&P National Programs - 1986-87 (estimated)

Region/C&P National Program		Person Years	Financial Resources ($'000)				
			Salaries	O&M	Grants & Contrib.	Capital	Total
Ontario							
1.1 Canada-US & Interjurisdictional Water Management		6.36	287.65	76.3	-	57.47	421.42
		(3.0)	(75.00)	(60.0)	-	(40.0)	(175.0)
.3 Water Quality Management Data		1.71	73.86	20.0	-	-	93.86
.1 Toxic Chemicals		3.41	147.02	41.1	-	10.0	198.12
	Total	11.48	508.53	137.4	-	67.47	713.4
		(3.0)	(75.0)	(60.0)		(40.0)	(175.0)
Western & Northern							
.1 Canada-US & Interjurisdictional Water Management		8.96	333.14	187.05	-	51.44	571.63
1.3 Water Quality Management Data		9.32	353.46	179.79	-	31.38	564.63
		(1.76)	(62.16)	(48.53)		(17.32)	(128.01)
.1 Toxic Chemicals		4.65	175.74	193.93	-	24.13	393.80
				(28.8)			(28.8)
	Total	22.93	862.34	560.77	-	106.95	1530.06
		(1.76)					(156.81)
orthwest Territories							
1.1 Canada-US & Interjurisdictional Water Management		0.42	16.68	20.8	-	0.6	38.08
.3 Water Quality Management		0.71	26.99	95.7	-	1.5	124.19
4.1 Toxic Chemicals		0.24	10.36	5.6	-	0.2	16.16
.3 Environ. Assessment & Baseline Studies		0.09	4.07	-	-	-	4.07
	Total	1.46	58.1	122.1	-	2.3	182.5
Pacific & Yukon							
.1 Canada-US & Interjurisdictional Water Management		1.0	45.7	6.0	-	-	51.7
1.3 Water Quality Management		9.5	386.6	149.0	-	40.0	575.6
.1 Toxic Chemicals		8.5	354.6	200.0	-	40.0	594.6
	Total	19.0	786.9	355.0	-	80.0	1221.9
W.Q.B.	TOTAL	163.12	6259.47	2342.72	197.0	621.22	9420.41
		(4.76)					(876.81)

"( ) " Represents Additonal non A-base Resources

Table 4
Water Quality Branch
Summary of Resources by C&P National Programs - 1986-87 (estimated)

C&P National Program	Person-Years		Financial Resources ($'000)					
	No	%	Salaries	O&M	Grants & Contrib.	Capital	Total	%
.1 Canada-US and Interjurisdictional Water Management	25.14 (3.0)	15.4	1019.27 (75.0)	358.15 (60.0)	-	119.51 (40.0)	1496.93 (175.0)	15.9
1.3 Water Quality Management Data	73.44 (1.76)	45.0	2633.31 (62.16)	956.49 (458.53)	197.0	295.88 (17.32)	4082.68 (538.01)	43.3
1.6 Management & Administration	4.6	2.8	322.0*	77.0	-	5.0	404.0	4.3
.1 Toxic Chemicals	51.05	31.3	1958.82	832.08 (28.8)	-	175.83	2966.73 (28.8)	31.5
.2 L.R.T.A.P. (Long Range transport of Airborne Pollutants)	8.8	5.4	322.0	119.0 (120.0)	-	25.0 (15.0)	466.0 (135.0)	4.9
.3 Environmental Assessment & Baseline Studies	0.09	0.1	4.07	-	-	-	4.07	0.1
W.Q.B. TOTAL	163.12 (4.76)	100	6259.47	2342.72	197.0	621.22	9420.41 (876.81)	100

"( )" Represents Additional non A-base Resources
* Includes 138.6 K salary reserve

Table 5
Water Quality Branch - 1986-87
Summary of Resources by C&P National Programs and Regions (estimated)

C&P National Program and Region	Person-Years No	Person-Years %	Financial Resources ($'000) Salaries	O&M	Grants & Contrib.	Capital	Total	%
1.1 Canada-US AND INTERJURISDICTIONAL WATER MANAGEMENT								
Headquarters	2.8	11.1	137.1	12.0	-	-	149.1	9.9
Atlantic	5.6	22.3	199.0	56.0	-	10.0	265.0	17.7
Quebec	-		-	-	-	-		
Ontario	6.36	25.3	287.65	76.3	-	57.47	421.42	28.2
	(3.0)		(75.0)	(60.0)		(40.0)	(175.0)	
Western & Northern	8.96	35.6	333.14	187.05	-	51.44	571.63	38.2
N.W.T.	0.42	1.7	16.68	20.8	-	0.6	38.08	2.5
Pacific & Yukon	1.0	4.0	45.7	6.0	-	-	51.7	3.5
Total	25.14	100	1019.27	358.15	-	119.51	1496.93	100
	(1.76)						(175.0)	
1.3 WATER QUALITY MANAGEMENT DATA								
Headquarters	41.5	56.5	1390.0	400.0	-	166.5	1956.5	47.9
				(410.0)			(410.0)	
Atlantic	4.4	6.0	162.0	42.0	-	15.0	219.0	5.4
Quebec	6.3	8.6	240.4	70.0	197.0	41.5	548.9	13.4
Ontario	1.71	2.3	73.86	20.0	-	-	93.86	2.3
Western & Northern	9.32	12.7	353.46	179.79	-	31.38	564.63	13.8
	(1.76)		(62.16)	(48.53)		(17.32)	(128.01)	
N.W.T.	0.71	1.0	26.99	95.7	-	1.5	124.19	3.1
Pacific & Yukon	9.5	12.9	386.6	149.0	-	40.0	575.6	14.1
Total	73.44	100	2633.31	956.49	197.0	295.88	4082.68	100
	(1.76)						(538.01)	
1.6 MANAGEMENT AND ADMINISTRATION								
Headquarters	4.6	100	322.0*	77.0	-	5.0	404.0	100
Total	4.6	100	322.0	77.0	-	5.0	404.0	100

* includes 138.6 K salary reserve

Table 5 continues on next page

Table 5 (cont'd)
Water Quality Branch - 1986-87
Summary of Resources by C&P National Programs and Regions (estimated)

C&P National Program and Region	Person-Years		Financial Resources ($'000)					
	No	%	Salaries	O&M	Grants & Contrib.	Capital	Total	%
4.1 TOXIC CHEMICALS								
Headquarters	21.35	41.8	771.1	198.15	-	50.0	1019.25	34.4
Atlantic	9.7	19.0	352.0	70.8	-	45.0	467.8	15.8
Quebec	3.2	6.3	148.0	122.5	-	6.5	277.0	9.3
Ontario	3.41	6.7	147.02	41.1	-	10.0	198.12	6.7
Western & Northern	4.65	9.1	175.74	193.93 (28.8)	-	24.13	393.8 (28.8)	13.3
N.W.T.	0.24	0.5	10.36	5.6	-	0.2	16.16	0.5
Pacific & Yukon	8.5	16.6	354.6	200.0	-	40.0	594.6	20.0
Total	51.05	100	1958.82	832.08	-	175.83	2966.73 (28.8)	100
4.2 L.R.T.A.P. (Long Range Transport of Airborne Pollutants)								
Headquarters	1.5	17.1	65.0	10.0	-	-	75.0 (20.0)	16.1
Atlantic	7.3	82.9	257.0	29.0 (100.0)	-	25.0 (15.0)	311.0 (115.0)	66.7
Quebec	-		-	80.0	-		80.0	17.2
Total	8.8	100	322.0	119.0	-	25.0	466.0 (135.0)	100
4.3 ENVIRONMENTAL ASSESSMENT AND BASELINE STUDIES								
N.W.T.	0.09	100	4.07	-	-	-	4.07	100
Total	0.09	100	4.07	-	-	-	4.07	100
W.Q.B. TOTAL	163.12 (4.76)	100	6259.47	2542.72	197.0	621.22	9420.41 (875.81)	100

D. PROJECT DESCRIPTIONS
Descriptions de projects

D.1 ATLANTIC REGION
Région de l'Atlantique

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1985/1987

REGION Atlantic
PROJECT NO. 1

PROJECT TITLE:

International Saint John &St. Croix River

NATIONAL PROGRAM NAME:

Canada/US Interjurisdictional Water Management

C&P CODE: 1.1

DURATION: ongoing

STUDY TEAM: T.L. Pollock, P.E. Belliveau, G.D. Howell, D.M. Lockerbie, D.H. Cullen

TEL: 857-6606

GOALS:

1. To assist Canada/US Committee on Water Quality, Saint John R. in reporting biannually on River quality in respect to Water Quality Objective
2. To assist IJC Pollution Adkvisory Board, St. Croix R. in maintaining Water Quality to support Anadromous Fish Passage.
3. To produce IWD non technical report on status of Water Quality in St. Croix R. basin.

RATIONALE:

Meet Canadian commitments on Water Quality International Waters.

DESCRIPTION:

Saint John River

The surveillance for compliance with established water quality objectives will contin in 1986-87 by monitoring every six weeks for listed parameters. Bacteriological sampling will be conducted as part of the monitoring program.

St. Croix River

The surveillance of the St. Croix R., to meet the requirements of the IJC Pollution Advisory Board, will be made eight times in 1986/87. In addition surveillance of additional sites in the Upper portions of the St. Croix will be made between April 1 and September 1986 as part of an integrated IWD Atl. Reg. study of the St. Croix.

Outputs

a) Report on all data collected from 11 stations, at 6 week intervals, on the Inter'l Saint John River will be prepared by 31 March 1987.
b) An aWQM will be set up in Presquile R. and evaluated in the June-November period.
c) In the lower St. Croix River information from five stations sampled every 6 weeks will be compiled in a data and interpretive report for the IJC Pollution Advisory Board.
d) In the Upper St. Croix information from three sites sampled at 6 week intervals will be integrated with data collected by WPM and WR Branches in a report for general distribution.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF	---	
TOTAL PY	4.5	-------
SALARIES	160.	
O&M	48.0	
CONTRACTS		
CAPITAL	10.0	
TOTAL	218.0	-------

Map No.	NAQUADAT NO.	STATION LOCATION
1	00NB01AD0013	St. Francis River at picnic site
2	00NB01AD0017	Saint John River at Clair
3	00NB01AD0016	Madawaska River below Fraser Mill outfall
4	00NB01AF0021	Green River at WSC Gauge
7	00NB01AF0005	Saint John River, above dam at Grand Falls
8	00NB01AG0003	Limestone Stream at Four Falls
9	00NB01AG0001	Aroostook River at Tinker Dam
10	00NB01AJ0012	Big Presquile Stream at Can/U.S. Border
11	00NB01AJ0029	Meduxnekeag River at Belleville
6	00NB01AF0038	Saint John River below Edmurdston
5	00NB01AD0008	Saint John River above Edmundston
12	00NB01AR0013	St. Croix River at Kellyland (Can. side)
13	00NB01AR0014	St. Croix River at 200 m below Woodland Mill
17	00NB01AR0020	St. Croix River at Milltown (U.S. side)
18	00NB01AR0001	St. Croix River at Milltown (Can. side)
19	00NB01AR0021	St. Croix River at Milltown (Can. side)
14	00NB01AR0011	Grand Lake Outlet at Forest City
15	00NB01AR0002	St. Croix R. at St. Croix

Parameters

Field

Temperature
Dissolved Oxygen (Meter and Winkler)
pH
Specific Conductance

Laboratory

pH
Specific Conductance
Colour
Turbidity
Total Alkalinity
Calcium
Magnesium
Potassium
Sodium
Sulphate
Cadmium - extractable
Lead - extractable
Copper - extractable
Zinc - extractable
Iron - extractable
Mercury-extractable
DOC
Dissolved Inorganic Carbon
Aluminum - extractable
Total Suspendid Solids
Total Phosphorus
Phosphate - total dissolved
Nitrate & Nitrite
Ammonia N
Nitrogen - total

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 2

PROJECT TITLE:
Water Quality Objectives and Guidelines

NATIONAL PROGRAM NAME:
Canada/US Interjurisdictional Water Management

C&P CODE: 1.1

DURATION: ongoing

STUDY TEAM: P. E. Belliveau
R. A. Arseneault

TEL: 857-6606

GOALS:

1. To assist WQB Ottawa prepare National documents and reports for CCREM.
2. To coordinate Water Quality Objective activity in International St. John River by chairing CAN/US subcommittee.
3. Review Water Quality Objectives established for St. Croix R.
4. Promote use of Water Quality Objectives by OGD.
5. Initiate Objective development under Can/Nfld. Water Quality Monitoring Agreement.

RATIONALE:

DESCRIPTION:

The long-term objective for this project is to promote the use of Water Quality Objectives as a water quality management tool to all water resources managers and to provide assistance and direction in the development of water quality objectives.

Outputs

a) Complete chapter for Canadian Water Quality Guidelines entitled, "Industrial Water Quality".

b) Prepare biannual Water Quality Report (1984-85) on International Saint John River for Can/U.S. committee.

c) Complete a Pilot Water Quality Objective study with DFO by Feb., 1987.

d) Formulate action plan for Water Quality Objective development under Can/Nfld. Water Quality Agreement.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF.		
TOTAL PY	1.1	
SALARIES	39.	
O&M	8.0	
CONTRACTS		
CAPITAL	-	
TOTAL	47.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 3

PROJECT TITLE:
Negotiating and Coordinating Federal/Provincial Water Quality Monitoring Agreements

NATIONAL PROGRAM NAME:
Water Quality Monitoring Data

C&P CODE: 1.3

DURATION: ongoing

STUDY TEAM: P.E. Belliveau, T.L. Pollock, R.A. Arseneault, D.H. Cullen

TEL: 857-6607

GOALS:

1. Assist WQB Ottawa in the national coordination and report preparation for Fed/Prov. Water Quality Agreements.
2. Coordinate 1st year Can/Nfld. Water Quality Agreement.
3. Complete Water Quality Agreement negotiations with N.B. & P.E.I. and initiate negotiations with N.S. by 31 March 1987.

RATIONALE:

DESCRIPTION:

The long term objective is to negotiate and coordinate Federal/Provincial Water Quality Monitoring Agreements with each Province in the Atlantic Region.

Outputs

a) Participate in two National Agreements coordinating committee meetings.

b) Assist Agreement technical committees in report preparation.

c) Transmit Can/N.B. Agreement to respective ministers for signature by March 1987.

d) Complete Can/P.E.I. Agreement discussions by March 1987.

e) Initiate discussions on Can/N.S. Agreement by October 1986.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF	———	———
TOTAL PY	1.1	
SALARIES	39.0	
O&M	15.0	
CONTRACTS		
CAPITAL	5.0	———
TOTAL	59.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 4

PROJECT TITLE:
Federal/Provincial Water Quality Monitoring Agreement Assessment Activities

NATIONAL PROGRAM NAME:
Water Quality Management Data

CRP CODE: 1.3

DURATION: ongoing

STUDY TEAM:

TEL: 857-6606

GOALS:
1. As outlined in Can/Nfld. Agreement, maintain fixed basin monitoring network of Federal-Federal/Provincial-Provincial stations.
2. Establish the recurrent basin monitoring plan as outlined in Can/Nfld. Agreement.
3.

RATIONALE:

DESCRIPTION:

In conjunction with the province(s) to operate a series of federal, federal/provincia and provincial water quality stations for input to a national assessment of water quality. To operate a recurrent basin network to provide information on the pathways and persistence of substances deleterious to the environment. In 1986/87 this outlin will only apply to Newfoundland.

Outputs

a) Develop and present course to field sample collectors to be employed by Nfld. Environment.

b) Develop protocols for sample collection, shipment, data management.

c) Develop a recurrent basin sampling plan.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	0.6	
SALARIES	24.0	
O&M	6.0	
CONTRACTS		
CAPITAL		
TOTAL	30.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 5

PROJECT TITLE:

Electronic Data Processing & Servicing

NATIONAL PROGRAM NAME:

C&P CODE: 1.3

Water Quality Management Data

DURATION: ongoing

STUDY TEAM: R. A. Bingham
L. D. Wong

TEL: 857-6606

GOALS:
1. Provide regional EDP service for various Directorate projects.
2. Provide data processing services for Branch projects.
3. Provide electronic service for Branch projects.

RATIONALE:

DESCRIPTION:

Provision of a regional EDP service for various Directorate projects.

Outputs

a) Support re acquisition of data bases useful to Directorate scientists.

b) Assist WPM Branch in spreadsheet, model development, Branch systems compatability where economic, hardware acqusitions.

c) Maintain support of LABS-11 Data Management System both internally and externally.

d)_ Continue development NABIODAT system for managing biological data.

e) Maintain maintenance schedule for EDP equipment.

f) Maintain and operate Auto Water Quality Monitors.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF	----	------
TOTAL PY	1.4	
SALARIES	50.0	
O&M	15.0	
CONTRACTS		
CAPITAL	10.0	------
TOTAL	75.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGICN Atlantic
PROJECT NO. 6

PROJECT TITLE:
Regional Overview Network

NATIONAL PROGRAM NAME:
Water Management Data

C&P CODE: 1.3

DURATION: Will terminate as Fed/Prov. Water Quality Monitoring Agreements signed.

STUDY TEAM:

TEL: 857-6606

GOALS:
1. Co-ordinate the bimonthly sampling by WRB technicians of the 27 overview stations.
2.
3.

RATIONALE:
Overview Network established to maintain a WQB presence in each Province after "A" Base review.

DESCRIPTION:

This project consists of collecting water samples every two months from 27 locations in the Atlantic Region and analyzed for major ions, trace metals, nutrients plus any parameters of special concern during the sampling period. All samples are collected by WRB technicians while co-ordination and logistic support is handled by the WQB. Supplies in the form of sampling kits are shipped from Moncton to the WRB District Offices on the last day of the month preceeding the month samples are to be collected.

This Overview Network will be incorporated into the F/P Agreements as they are developed.

Outputs

a) There is no report prepared on the Overview Network as such, however the analytical results from several of the stations are used in the Regional LRTAP reports and summaries.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	0.6	
SALARIES	24.0	
O&M	3.0	
CONTRACTS		
CAPITAL		
TOTAL	27.0	

Map No.	NAQUADAT NO.	Station Location
7	01NB01AF0005	St. John River @ Grand Falls Headpond approx. 150 m. above dam.
11	00NB01AJ0029	Meduxnekeag River @ Bridge above junction with Mill Stream, Belleville, N.B.
28	00NB01AP0002	Kennebecasis River @ Hwy 880 Bridge, Apohaqui, N.B.
18	00NB01AR0001	St. Croix River @ International Bridge, Milltown, N.B.
29	00NB01BJ0056	Restigouche River @ Rafting Ground Brook, N.B.
30	00NB01BK0026	Nepisiquit River @ Hwy 360, N.B.
31	00NB01B00001	S.W. Miramichi River @ Bridge, Blackville, N.B.
32	00NB02BQ0044	N.W. Miramichi River @ Hwy 430 Bridge, Wayerton, N.B.
33	00NB01BU0031	Petitcodiac River @ TCH Bridge, Petitcodiac, N.B.
23	00NS01DC0001	Annapolis River @ Bridge, Wilmot Station, N.S.
34	00NS01DG0008	Shubenacadie River @ Bridge, Elmsdale, N.S.
35	00NS01DN0001	Wallace River @ TCH Bridge, Wentworth Centre, N.S.
36	00NS01EE0001	Medway River @ Bridge, Charleston, N.S.
37	00NS01F00005	St. Mary's River @ Hwy 7 Bridge, Stillwater, N.S.
38	00NS01FB0001	N.E. Margaree River @ Bridge, Margaree Valley, N.S.
39	00NS01FJ0001	Salmon River @ Salmon River Bridge, N.S.
40	00PE01CA0001	Carruthers Brook @ Bloomfield Park North of St. Anthony, PEI

Map No.	NAQUADAT No.	Station Location
41	00PE01CB0001	Dunk River @ Wall Road, PEI
42	00PE01CD0003	Morell River @ Bridge west of Bangor, PEI
43	00NF02YC0001	Torrent River @ Bristol's Pool, Nfld.
44	00NF02YJ0001	Harry's River @ Black Duck, Nfld.
45	00NF02ZH0001	Piper's Hole River @ Mothers Brook, Nfld.
46	00NF02ZK0001	Rocky River @ Hwy 6 Bridge, Colinet, Nfld.
47	00NF02YO0001	Exploits River @ Price Mill Bridge, Grand Falls, Nfld.
48	00NF02YM0001	Indian River near Springdale, Nfld.
49	00NF03QC0001	Eagle River above Eagle Falls, Lab.
50	00NF03OE0001	Churchill River @ Muskrat Falls, Lab.

Parameters

Field

Temperature

pH
DO

Laboratory

Temperature
pH
Turbidity
Alkalinity
Specfic Conductance
Colour
Calcium
Magnesium
Potassium
Sodium
Floride
Chloride
Sulfate

Phosphorus (Total)
Copper
Mercury
Zinc
Cadmium
Lead
Aluminum
Iron
Manganese
Dissolved Organic Carbon
Dissolved Inorganic Carbon
Nitrate & Nitrite
Ammonia
Nitrogen (Total)

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 7

PROJECT TITLE:
Sediment Laboratory in support of WRB

NATIONAL PROGRAM NAME:
Water Quality Management Data

C&P CODE: 1.3

DURATION: ongoing

STUDY TEAM: M. F. Wolfs

TEL: 857-6606

GOALS:
1. On a timely basis, analyse samples for physical sediment parameters.
2.
3.

RATIONALE:

DESCRIPTION:

Provision of physical sediment information, on samples collected by Water Resource Branch, for Water Resource Branch.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.	0.7	
PROF.		
TOTAL PY	0.7	
SALARIES	25.0	
O&M	3.0	
CONTRACTS		
CAPITAL		
TOTAL	28.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 8A

PROJECT TITLE:
Radioisotope Sample Collection

NATIONAL PROGRAM NAME:
Toxic Chemicals

C&P CODE: 4.1

DURATION: ongoing

STUDY TEAM: T. L. Pollock

TEL: 857-6606

GOALS:
1. Support WQB National Radioisotope Monitoring Program by Collecting water samples monthly from 6 sites in Atlantic Region.
2.
3.

RATIONALE:

DESCRIPTION:

The collection of monthly water samples from 6 sites in Atlantic Region for the determination of background radioisotope levels.

Outputs

a) Yearly aliquots which are aggregrates of monthly samples forwarded to NWRI for analysis.

b) Report on radioisotope levels prepared annually by WQB Ottawa.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.	0.1	
PROF		
TOTAL PY	0.1	
SALARIES	4.0	
O&M	0.5	
CONTRACTS		
CAPITAL		
TOTAL	4.5	

National Radioisotope Monitoring Program

MAP NO.	NAQUADAT NO.	SAMPLER	STATION LOCATION
21	02NB01AQ0001	WRB	Mosse Creek at Hwy 790 Bridge near Change Harbour, St. John County, N.B.
22	02NBC1BU0002	WQB	Peticodiac River at Gunningsville Bridge, Moncton, N.B.
12	00NB01AR0013	WRB	St. Croix R. at Kellyland
23	00NS01DC0001	WRB	Annapolis River at Bridge, Wilmot, N.S.
24	00NS01FJ0020	WRB	McAskill brook at Hwy Bridge on road to Birch Grove near Glace Bay
25	00NF03NG0004	Contractor	Ranger Bight Brook outlet at Ranger Bight, 2 km West of Makkovik, Labrador

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 8B

PROJECT TITLE:
Toxic Chemcial Survey of 10 Drinking Water Sources in each Atlantic Province

NATIONAL PROGRAM NAME:
Toxic Chemicals

C&P CODE: 4.1

DURATION: 4 year study 86/87 2nd year

STUDY TEAM: D. H. Cullen G. L. Brun
T. L. Pollock H. S. Bailey

TEL: 857-6606

GOALS:
1. To carry out sampling and analysis of 40 Drinking Water sources in Atlantic Canada.
2.
3.

RATIONALE:
Measurement of Toxic Chemcials in Inland Waters.

DESCRIPTION:

The sampling and analysis of 10 Drinking Water sources in each Atlantic Province is a four year joint Provincial, WQB, National Health & Welfare study, the project is now in its second year.

Outputs

a) Sampling conducted Spring and Fall at each site with results from each discussed at meetings held with Provinces in September and March each year.

b) A summary report of 1985/86 study results at both the raw water (analyzed by WQB) and treated water (analyzed by NH&W) will be prepared.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	4.1	
SALARIES	150.0	
O&M	33.0	
CONTRACTS		
CAPITAL	20.0	
TOTAL	203.0	

Water Supply Sources to be sampled: 1986:

Prince Edward Island

St. Eleanors
Malpeque Main Well
Summerside (2 wells)
Union well #5
Brackley well #6
Souris
Kensington
Georgetown
Parkdale

Newfoundland

Bonavista
Plate Cove East
Hickman Harbour
Port Blandford
Gambo
Trinity B. Bay
Newton B. Bay
Gander Bay South
Twillingate
Lewisporte

Nova Scotia

Westville
Trenton
Truro (2 sites)
Elmsdale
Greenwood
Middleton
Canning
Port Williams
Windsor

New Brunswick

To be confirmed later

Parameters

The following is a list of Chemical Parameters for the 1986/87 study:

PARAMETER	NAQUADAT No.	Detection Limit
Physical Determinations		
Colour	02011	L5.
Specific Conductance	02041	0.2 uS/cm
Turbidity	02073	-
pH	10301	-
Major Ions & Other Tests		
Alkalinity - Total	10101	0.5 mg/L
Calcium	20110	0.1 "
Magnesium	12107	0.1 "
Sodium	11103	0.1 "
Potassium	19103	0.1 "
Chloride (s.i.e.)	17205	0.5 "
Sulfate-Colour, or (I.C.)	16304 (16309)	1.0 " (0.5)
Nitrate-Nitrite	07110	0.01 "
Diss. Organic Carbon	06107	1.0 "
Silica	14102	0.1 "
Humic Substances	06581	1.0 "
Fluoride	09105	0.05 "
Metals - Total Extractable		
Aluminum (S.E.)	13305	0.01 "
Chromium (D.A.)	24302	0.02 "
Manganese (D.A.)	25304	0.01 "
Iron (S.E.)	26305	0.002 "
Nickel (S.E.)	28302	0.002 "
Copper (S.E.)	29305	0.002 "
Zinc (D.A.)	30304	0.01 "
Arsenic - Total (Hydride A.A.S.)	33007	0.0002"
Cadmium (S.E.)	48302	0.001 "
Mercury - Total	80315	0.02 ug/L
Lead (S.E.)	82302	0.002 mg/L
Organochlorine Pesticides & PCB's		
* p,p'-DDT	18000	0.001 ug/L

* o,p'-DDT	18005	0.001	"
* p,p'-DDD	18010	0.001	"
* p,p'-DDE	18020	0.001	"
* p,p'-Methoxychlor	18030	0.01	"
* Heptachlor	18040	0.001	"
* Heptachlor epoxide	18045	0.001	"
-Endosulphan	18050	0.01	"
-Endosulphan	18055	0.01	"
* -Chlordane	18060	0.005	"
* -Chlordane	18065	0.005	"
* Lindane	18070	0.001	"
-BHC	18075	0.001	"
Mirex	18125	0.001	"
* Aldrin	18130	0.001	"
* Endrin	18140	0.01	"
* Dieldrin	18150	0.001	"
Arochlor Total	18164	0.005	"

Chlorinated Benzenes

1,3-Dichlorobenzene	17820	0.02	ug/L
1,4- "	17821	0.02	"
1,2- "	17822	0.02	"
1,3,5-Trichlorobenzene	17830	0.004	"
1,2,4- "	17831	0.004	"
1,2,3- "	17832	0.004	"
1,2,3,5-Tetrachlorobenzene	17840	0.002	"
1,2,4,5- "	17841	0.002	"
1,2,3,4- "	17842	0.002	"
Pentachlorobenzene	17850	0.002	"
Hexachlorobenzene	17812	0.002	"

Polyaromatic Hydrocarbons

Fluoranthene	18904	0.005	ug/L
Benz(b) Fluoranthene	18901	0.003	"
Benz(k) Fluoranthene	18903	0.002	"
Benz(a) Pyrene	18900	0.003	"
Indeno (1,2,3,cd) Pyrene	18905	0.005	"
Benzo (g,h,i) Perylene	18902	0.006	"

Organophosphate Pesticides

Azinphosethyl	18195	0.10	ug/L
Azinphosmethyl	18190	0.10	"
Carbophenothion	18320	0.020	"
Crufomate	18320	0.050	"
* Diazinon	18270	0.010	"
Disulfoton	18215	0.005	"
Ethion	18310	0.010	"
Fenitrothion	18330	0.010	"
Imidan	18205	0.10	"
Malathion	18250	0.010	"
* Methyl parathion	18245	0.010	"

Methyl Trithion	18325	0.020	"
* Parathion	18240	0.010	"
Phorate	18300	0.005	"
Ronnel	18260	0.010	"
Chlorinated Phenols			
2,6-Dichlorophenol	-	-	
2,5- "	-	-	
2,4- "	-	-	
3,5- "	-	-	
2,3- "	-	-	
3,4- "	-	-	
2,4,6-Trichlorophenol	-	-	
2,3,6- "	-	-	
2,3,5- "	-	-	
2,3,4- "	-	-	
3,4,5- "	-	-	
2,3,5,6-Tetrachlorophenol	-	-	
2,3,4,6- "	-	-	
2,3,4,5- "	-	-	
Pentachlorophenol	-	-	
Carbamate Pesticides			
Aldicarb	-	-	
* Carbaryl	-	-	

N.B.: Those compounds flagged by an asterisk (*) have acceptable maximum concentrations listed in the 1978 edition of "Canadian Drinking Water Quality Guidelines".

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 8C

PROJECT TITLE:
Transport, transformation and effects of Deltamethrin in an agriculture watershed in P.E.I.

NATIONAL PROGRAM NAME:
Toxic Chemicals

C&P CODE: 4.1

DURATION: 1986/87

STUDY TEAM: T.A. Clair, T. L. Pollock

TEL: 857-6606

GOALS:
1. To support NWRI, EPS in setting up and operation of a joint study on the fate, persistence and transportation of deltamethrin in an
2. agriculture environment in P.E.I.
3.

RATIONALE:
Measurement and Characteristics of Toxic Chemicals

DESCRIPTION:

To study fate, persistence and transportation of an aerially applied pesticide (deltamethrin) to an agricultural area of P.E.I., together with NWRI, EPS and Province of PEI.

Outputs

a) Select study area in cooperation with EPS-NWRI.

b) Samples of water, sediments and benthic invertebrates before and monthly after spray (till end of November) from sites both above and below spray block, for analysis by NWRI.

c) Chemical characterization of sample sites, including major ions, nutrients, metals, OC's and PCB's.

d) In 1987/88 produce a report on concentration, transport and fate of deltamethrin in water, suspended matter and sediments.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	1.0	
SALARIES	36.0	
O&M	5.0	
CONTRACTS		
CAPITAL		
TOTAL	41.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGICN Atlantic
PROJECT NO. 8D

PROJECT TITLE:
Aldicarb in Groundwater in P.E.I.

NATIONAL PROGRAM NAME:
Toxic Chemicals

O&P CODE: 4.1

DURATION: 1986/87

STUDY TEAM: T. A. Clair

TEL: 857-6606

GOALS:
1. To colelct groundwater samples at a site in P.E.I. to be selected by NHRI.
2.
3.

RATIONALE:

DESCRIPTION:

Joint study with NHRI of aldicarb residues in groundwater at field sites in P.E.I. and the development of a model of pesticide migration and fate.

Outputs

a) At preselected time (twice in FY) collect, using pump, water from groundwater wells in P.E.I. About 60 of the collected samples will be analyzed at WQB Moncton, the remainder to be shipped to NWRI.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	0.5	
SALARIES	18.0	
O&M	4.0	
CONTRACTS		
CAPITAL		
TOTAL	22.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 8E

PROJECT TITLE:
Pesticides in surface waters in an agricultural basin of Northern N.B.

NATIONAL PROGRAM NAME:

C&P CODE: 4.1

Toxic Chemcials

DURATION: 1986-1988

STUDY TEAM: T. A. Clair

TEL: 857-6606

GOALS: 1. To measure concentrations of commonly used organophosphate pesticides, 2,4-D, atrazine, MCPA and dinoseb in water and sediments befor the agricultural spray season, late June, early August and late fall.

RATIONALE:

DESCRIPTION:

Conduct a survey of commonly used pesticides in water and sediment in a basin being influenced by agricultural activity.

Outputs

a) By early May select study basin with cooperation of N.B. DOE, Agriculture canada, WPM.

b) In May, June and October sample water and sediments in drainage basin.

c) Prepare a report on findings by April 1987.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	3.0	
SALARIES	108.0	
O&M	20.0	
CONTRACTS		
CAPITAL	25.0	
TOTAL	153.0	

Parameters and Samples

	Water x	# of samples 45	Sediment x	# of samples 50	Biota x	# of samples 6
major ions	X					
nutrients incl PO_4	X					
suspended solids	X					
metals	X				X	
disulfotan	X		X			
diazinon	X		X			
malathion	X		X			
phorate	X		X			
phosmet	X		X			
OC's & PCB	X		X			
2,4-D	X		X			
MCPA	X		X			
dinoseb	X		X			
alachlor	X		X			
metribuzin	X		X			
atrazine	X		X			
dalopon	X		X			
glyphosate	X		X			
EPTC	X		X			
linuron	X		X			
mancozeb	X		X			
chlorothalonil	X		X			
aldicarb	X		X			
carbofuran	X		X			
organic carbon			X			
sediment size			X			
% lipid						

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 8F

PROJECT TITLE:
Micro-biological and Toxicant Screening - St. John River

NATIONAL PROGRAM NAME:

C&P CODE: 4.1

Toxic Chemicals

DURATION: 4 weeks - 1986

STUDY TEAM: T. A. Clair

TEL: 857-6606

GOALS:
1. Provide logistic assistance to NWRI in sampling 30 sites in Saint John River Basin for MICROTOX.
2.
3.

RATIONALE:

DESCRIPTION:

A joint NWRI-WQB study of Saint John River using MICROTOX Techniques.

Outputs

a) Select 30 sites in Saint John River Basin with input from N.B. DOE.

b) In September assist NWRI in MICROTOX sampling.

c) During sampling for MICROTOX collect water and sediment samples for possible follow up chemical analysis should these be required by NWRI for confirmation purposes.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	0.2	
SALARIES	6.0	
O&M	2.0	
CONTRACTS		
CAPITAL		
TOTAL	8.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 8G

PROJECT TITLE:

Survey of Mercury Levels in Sisson Branch Reservoir and Trousers Lake and Madawaska River

NATIONAL PROGRAM NAME:

C&P CODE: 4.1

Toxic Chemcials

DURATION:

STUDY TEAM:

TEL: 857-6606

GOALS: 1. To provide analytical support to DFO and NB DOE in the analysis of 120 fish tissue and 32 sediment samples from the Sisson Branch Reservoir, Trousers Lake and Madawaska River.

RATIONALE:

DESCRIPTION:

As a follow up to WQB report IWD-AR-WQB-85-88 which reported on elevated levels of Mercury in fish samples, the WQB in cooperation with DOF and N.B. DOE will resample fish specimens and sediments from the three areas which exhibited the highest mercury levels.

Outputs

a) Analysis of 120 fish tissues and 32 sediment samples for Mercury.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	0.3	
SALARIES	10.0	
O&M	0.3	
CONTRACTS		
CAPITAL		
TOTAL	13.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. 8H

PROJECT TITLE:
Miscellaneous Toxic Chemical Activities

NATIONAL PROGRAM NAME:

C&P CODE: 4.1

Toxic Chemcials

DURATION:

STUDY TEAM:

TEL: 857-6606

GOALS: 1.

2.

3.

RATIONALE:

DESCRIPTION:

Data and advisory inputs to Regional and National Toxic Chemical Committees and interested agencies.

Outputs

a) All minutes of meeting associated with toxic chemicals (pesticide, etc.) will be forwarded to IWD regional managers within one week of receipt.

b) A report identifying and quantifying levels of toxic chemicals found in 1985/86 study of Wilmot Basin will be completed by November 30, 1986.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	0.5	
SALARIES	10.0	
O&M	3.0	
CONTRACTS		
CAPITAL		
TOTAL	13.0	

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. WQ-9

PROJECT TITLE:

Organics in Atmospheric Precipitation

NATIONAL PROGRAM NAME:

C&P CODE: 4.1

DURATION: ongoing

STUDY TEAM: G. L. Brun

TEL: 857-6606

GOALS:
1. Obtain data on the contribution of selected toxic organic compounds, in precipitation, at three sites.
2.
3.

RATIONALE:

DESCRIPTION:

Collection of precipitation samples from 2 sites in Nova Scotia and 1 site in Prince Edward Island for selected Toxic Chemical analysis.

Outputs

a) Collect wet only precipitation samples monthly from sites in Kejimkujik National Park, Ellerslie, P.E.I., and Jackson, N.S. and analyse for PAH's, OC's, PCB's, and chlorobenzenes.

b) By May 31, 1986 evaluate all data from 5 years collection and make recommendations on future of project.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	0.3	
SALARIES	10.0	
O&M	3.0	
CONTRACTS		
CAPITAL		
TOTAL	13.0	

MAP NO.	NAQUADAT NO.	STATION LOCATION
77	33NS01DN0001	Jackson, Nova Scotia
78	33NS01ED0004	Kejimkujik National Park, N.S.
79	33PE01CA0001	Ellerslie Biological Station P.E.I.

Parameters Frequency

OC, PCB - Monthly
Chlorobenzenes - Monthly
PAH - Monthly

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. WQ-10

PROJECT TITLE:

Kejimkujik Basin LRTAP Survey

NATIONAL PROGRAM NAME:

C&P CODE: 4.2

Long Range Transport of Air Pollutants

DURATION: ongoing

STUDY TEAM: T. A. Clair

TEL: 857-6606

GOALS:

1. Continuation of Winter and Spring Water and Snow Quality Sampling.
2. Continuation of long term monitoring of CWS sites during Summer.
3. Collaboration with NWRI on characteristics of organics in samples of brown waters in S.W. Nova Scotia.

RATIONALE:

DESCRIPTION:

To study pathways of sulphur and nitrogen in an acidified brownwater basin in Nova Scotia.

Outputs

a) Continuation of pH, conductivity, temperature probe study of Mersey River and complete a report on its use by October 1986.

b) Continuation of weekly sampling of Mersey River, Rodgers Bk, and Moose Pit Brook.

c) To sample snowpack weekly (Nov.-April) for water content and chemistry and prepare data report by Dec. 1986.

d) To prepare a report showing inter-relationship between labile Al, DOC, and pH by March 1987.

e) Analyse 400 samples for major ions and metals and 120 samples for Al in support of NWRI.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	3.1	
SALARIES	110.0	
O&M	14.0	
CONTRACTS		
CAPITAL	15.0	
TOTAL	139.0	

WQB Sampling Sites in Kejimkujik Basin

01NS01ED0027	Beaverskin Lake
00NS01ED0023	Beaverskin outflow
01NS01ED0010	Pebbleloggitch Lake
00NS01ED0022	Pebbleloggitch outflow
00NS01ED0027	Mt. Tom Brook
00NS01ED0026	Atkins Brook
00NS01ED0019	Little R.
00NS01ED0018	West R.
00NS01ED0024	Grkafton Brook
01NS01ED0007	Kejimkujik Lake
00NS01ED0005	Mersey R. below Mill Falls
00NS01ED0001	Mersey R. at outlet of George L.
00NS01ED0028	Beaverskin Inflow
00NS01ED0029	Beaverskin Inflow #2

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION Atlantic
PROJECT NO. WQ-11

PROJECT TITLE:
LRTAP Lake and Stream Monitoring

NATIONAL PROGRAM NAME:
Long Range Transportation of Air Pollutants

C&P CODE: 4.2

DURATION: ongoing

STUDY TEAM:

TEL: 857-6606

GOALS:
1. Collection of Water Quality Data for use in determining LRTAP Trends in Lakes and Rivers in N.S., N.B., Nfld.
2.
3.

RATIONALE:

DESCRIPTION:

To sample 78 lakes in Atlantic Region to detect trends in acid precipitation parameters and monitor the water quality of 27 streams for long term trend detection.

Outputs

a) Conduct twice yearly sampling of 78 lakes and monthly sampling of 27 streams.

b) Refine data retrieval system for NABIODAT.

c) Prepare report on assessment of long term monitoring data incorporating trend analysis by Sept. 1986.

d) To prepare updated sensitivity map utilizing all pertinent NAQUADAT data by Sept. 1986.

e) Together with WQB Ottawa prepare a report linking zooplankton populations to water quality of LRTAP sampled lakes by March 1987.

f) Cooperate with DFO in fish population and diversity studies on LRTAP lakes in N.S. and Nfld.

A-BASE RESOURCES ($'000)

	Total	Cost Recoverable
PY TECH.		
PROF		
TOTAL PY	4.2	
SALARIES	147.0	
O&M	15.0	
CONTRACTS		
CAPITAL	10.0	
TOTAL	172.0	

Map. No.	NAQUADAT No.	Station Location
		Nova Scotia
36	00NS01EE0001	Medway River
62	00NS01EC0005	Roseway River
63	00NS01EA0001	Tusket River
64	00NS01EN0002	Liscomb River
65	00NS01EF0002	Lahave River
37	00NS01E00001	St. Mary's River
66	00NS01DE0001	Avon River at Power Dam
67	00NS01DL0009	Kelley River
35	00NS01DN0001	Wallace River
68	00NS01DA0001	Meteghan River
69	00NS01ER0002	Clam Harbour River
60	00NS01ED0005	Mersey River
61	00NS01ED0030	Rogers Brook
59	00NS01EE0015	Whiteburn Brook
		New Brunnswick
70	00NB01AQ0001	Lepreau River
71	00NB01BV0015	Ponte Wolfe River
72	00NB01AN0001	Salmon River at Gaspereaux Forks
73	00NB01AM0001	North Branch Oromocto River
		Newfoundland and Labrador
74	00NF02ZB0001	Isle aux Morts River
43	00NF02YC0001	Torrent River @ Bristol's Pool
44	00NF02YJ0001	Harry's River @ Black Duck
45	00NF02ZH0001	Piper's Hole River @ Mother's Brook
46	00NF92ZK0001	Rocky River @ Colinet
47	00NF02Y00001	Exploits River @ Grand Falls
48	00NF02YM0001	Indian Brook @ Springdale
75	00NF02ZD0003	Grey River @ CWS Gauge
51	00NF02ZG0016	Garnish River
52	00NF02ZC0001	Grandy Brook
49	00NF03QC0001	Eagle River above Eagle Falls
50	00NF030E0001	Churchill River at Muskrat Falls

Acid Precipitation Lake Sampling in Southwestern Nova Scotia

Map No.	NAQUADAT No.	Station Location
121	01NS01ED0001	Back Lake in middle
122	01NS01ED0002	Big Dam West Lake in middle
123	01NS01ED0003	Big Dam East Lake in middle
124	01NS01ED0004	Mountain Lake in centre of north part
125	01NS01ED0005	Peskowesk Lake N.W. of tip of Isle de l'Original
126	01NS01ED0006	Grafton Lake in centre
127	01NS01ED0007	Kejumkujik Lake 200 m. S.W. of Peale Island
128	01NS01ED0008	High Lake in middle
129	01NS01ED0010	Pebbleloggitch Lake in middle
130	01NS01ED0011	Coblielle Lake in middle
131	01NS01ED0013	Ben Lake in middle
132	01NS01ED0014	Big Red Lake
133	01NS01ED0015	Mud Lake in middle
134	01NS01ED0016	Snake Lake in middle
135	01NS01ED0017	Liberty Lake in middle
136	01NS01ED0019	Frozen Ocean Lake in middle
137	01NS01ED0020	Central Lake
138	01NS01ED0021	Little Red Lake at S.E. side
139	01NS01ED0022	Poplar Lake in middle
140	01NS01ED0025	Luxion Lake in middle
141	01NS01ED0027	Beaverskin Lake in middle of west part
142	01NS01ED0028	McGinty Lake in middle
143	01NS01ED0029	Peskawa Lake in middle
144	01NS01ED0030	Upper Silver Lake in middle of South basin
145	01NS01ED0043	Mount Tom lake - Kej. Nat'l Park
146	01NS01ED0047	George Lake - Kej. Nat'l Park
147	01NS01ED0048	Loon Lake - Kejimkujik Nat. Park
148	01NS01EA0010	Trefry Lake 300 m N.N.E. of outlet
149	01NS01EA0011	Allens Lake
150	01NS01EA0013	Milton Lake just North of centre
151	01NS01EA0014	Churchill Lake about 300 m. S.W. of inlet
152	01NS01EA0016	Darling lake 300m S. of inlet from Coggins Lake
153	01NS01EA0002	Lake George, 15 km N.E. of Yarmouth (water supply)
154	01NS01EA0004	Jesse Lake, Yarmouth Co.
155	01NS01EA0005	Doctor Lake 300 m S.W. of large island
156	01NS01EA0009	Brenton Lake near centre
157	01NS01DA0002	Tedford Lake, Digby Co.
158	01NS01DA0003	Killam Lake 250 m. N.W. of inlet from Lake George
159	01NS01DA0004	Cedar lake 100 mg. S.W. of large point at N. end
160	01NS01DA0005	Lower Corning lake 550 m S.E. of Corning Brook
161	01NS01DA0006	Pierce Lake 175 m. W. of N.E. Shore
162	01NS01DA0007	Coggins Lake about 300 m. N. of Southern Shore
163	01NS01EA0019	Snarl Lake 440 m. N.E. of N.W. outlet
164	01NS01EA0020	Bird lake about 200 m. E. of N.W. Shore

Map. No.	NAQUADAT No.	Station Location
		Acid Precipitation Sampling in Newfoundland
87	01NF02YH0001	Wigwam Pd
88	01NF02YK0006	Center of Glover Island
89	01NF02YM0001	East of Adies Pd
90	01NF02YM0001	Near Noble Pd
91	01NF02YM0003	North of Upper Indian Pd
92	01NF02YM0006	Near Middle Arm
93	01NF02YM0007	N.W. of Burlington
94	01NF02YN0008	Sandy Lake S.W. of Buchans
95	01NF02Y00007	Gull Lake
96	01NF02Y0009	Tally Pond
97	01NF02YQ0001	Bellman's pd
98	01NF02YR0005	Near Ocean Pd and T.M. Pd
99	01NF02YS0003	Rattle Pd
100	01NF02YS0005	Shallow Pd #3
101	01NF02YS0009	Ochre Hill Pd
102	01NF02YS0010	Chatman Pd W.
103	01NF02YS0016	Nameless Pd #2
104	01NF02YS0021	Bog Pd
105	01NF02YS0029	Long Waters S.
106	01NF02YS0045	Jay Pond
107	01NF02YS0048	Mosses Cove Pd
108	01NF02ZB0001	Big Pond
109	01NF02ZC0002	Near Knowle's Bk
110	01NF02ZC0003	Stephenson's Pd
111	01NF02ZD0001	Near Dollard Bk
112	01NF02ZD0002	Pd W. of Wolf Lake
113	01NF02ZF0003	Pd N. of Gisbourne L.
114	01NF02ZF0004	Hungry Grove Pd
115	01NF02YH0011	Unnamed Pd. Gros Morne at Nat. Park
116	01NF02YH0012	Unnamed Pd. Gros Morne at Nat. Park
117	01NF02YH0013	Unnamed Pd. Gros Morne at Nat. Park
118	01NF02YH0014	Unnamed Pd. Gros Morne at Nat. Park
119	01NF02YL0015	Unnamed Pd. Gros Morne at Nat. Park
120	01NF02YH0010	Unnamed Pd. Gros Morne at Nat. Park

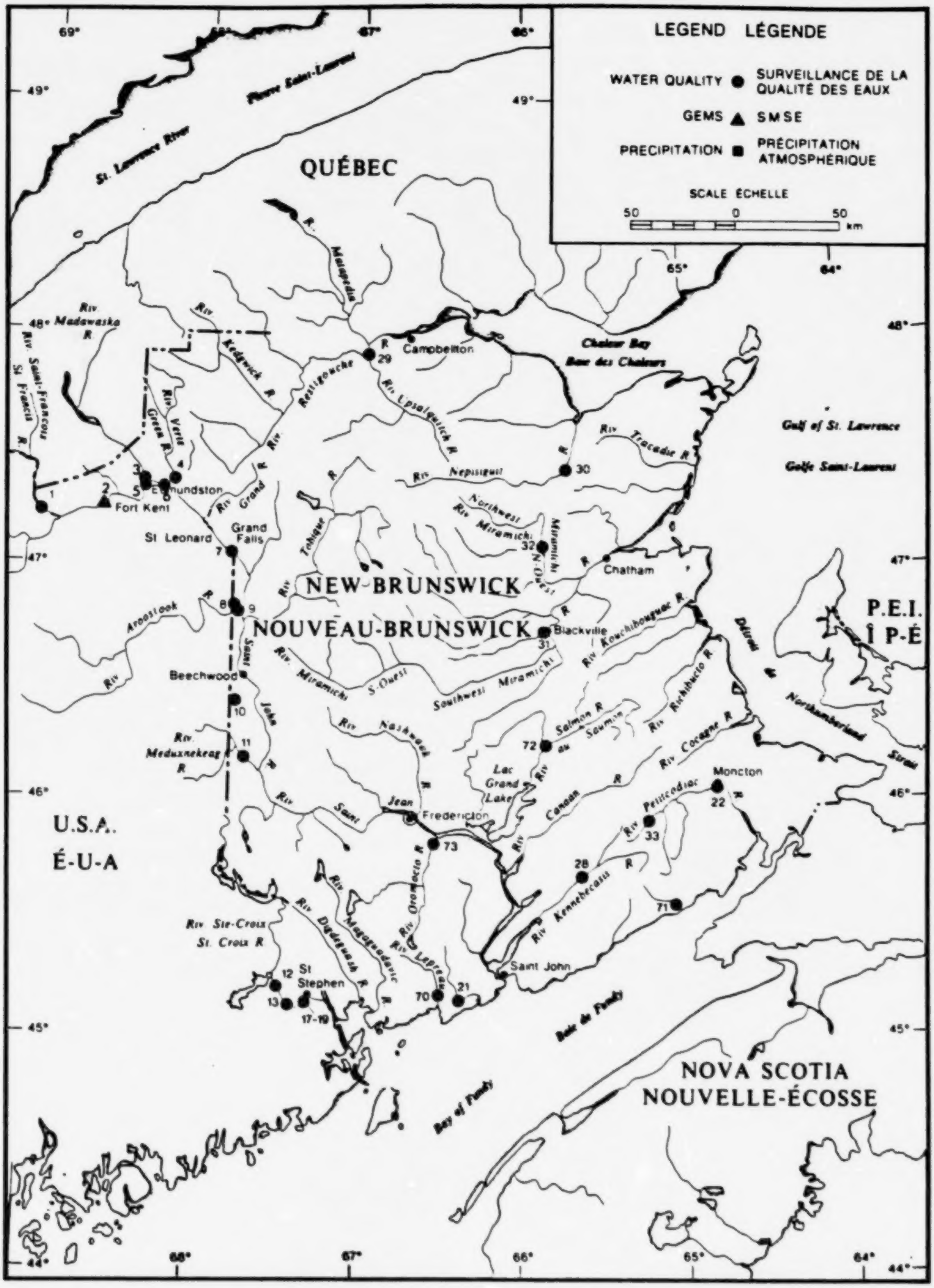
Water Quality Branch Parameter List for the Acid Precipitation monitoring sites in the Atlantic Region

Field

Water Temperature
pH
Instantaneous or Mean daily discharge (Rivers only)
Specific Conductance

Laboratory

Colour (Nessler relative units)
Conductivity (uS. cm^{-1})
pH
Turbidity (JTU'S)
Alkalinity (Gran and/or Total-depending on pH))
Sulfate (MIB, $mg.L^{-1}$)
Sulfate (Ion Chromatograph, $mg.L^{-1}$)
Chloride
Fluoride
Calcium
Magnesium
Potassium
Sodium
Silica (Reactive)
Iron (Extractable)
Manganese (Exractable)
Copper (Extractable)
Zinc (Extractable)
Cadmium (Extractable)
Lead (Extractable)
Aluminum (Extractable)
Carbon (Dissolved organic)
Nitrogen (Total)
Nitrate-Nitrite
Humic Acids (Fluorometry)
Total Phosposrus


LEGEND LÉGENDE
WATER QUALITY ● SURVEILLANCE DE LA QUALITÉ DES EAUX
GEMS ▲ SMSE
PRECIPITATION ■ PRÉCIPITATION ATMOSPHÉRIQUE
SCALE ÉCHELLE
50 0 50 km
QUÉBEC
St. Lawrence River
Fleuve Saint-Laurent
NEW-BRUNSWICK
NOUVEAU-BRUNSWICK
U.S.A.
É-U-A
NOVA SCOTIA
NOUVELLE-ÉCOSSE
P.E.I.
Î P-É
Chaleur Bay
Baie des Chaleurs
Golf of St. Lawrence
Golfe Saint-Laurent
Détroit de Northumberland Strait
Bay of Fundy
Baie de Fundy
Campbellton
Edmundston
Fort Kent
St Leonard
Grand Falls
Beechwood
Fredericton
Chatham
Blackville
Moncton
Saint John
St Stephen
Lac Grand Lake
Riv. Madawaska R.
Riv. Saint-François St Francis R.
Riv. Verte
Green R.
Kedgwick R.
Riv. Restigouche
Riv. Upsalquitch R.
Matapedia R.
Riv. Grand R.
Riv. Tobique R.
Riv. Nepisiguit R.
Northwest Riv. Miramichi
Miramichi N.-Ouest R.
Riv. Tracadie R.
Riv. Kouchibouguac R.
Riv. Richibucto R.
Riv. Miramichi S.-Ouest
Southwest Miramichi R.
Riv. Nashwaak R.
Aroostook R. Riv.
Saint John R. Riv. Saint Jean
Riv. Meduxnekeag R.
Salmon R. Riv. au Saumon
Riv. Cocagne R.
Riv. Canaan R.
Riv. Petitcodiac R.
Riv. Kennebecasis R.
Oromocto R.
Riv. Ste-Croix St. Croix R.
Riv. Digdeguash R.
Riv. Magaguadavic
Riv. Lepreau
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67°
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48°
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45°
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FIGURE 1 WATER QUALITY BRANCH MONITORING STATIONS 1986-87 STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

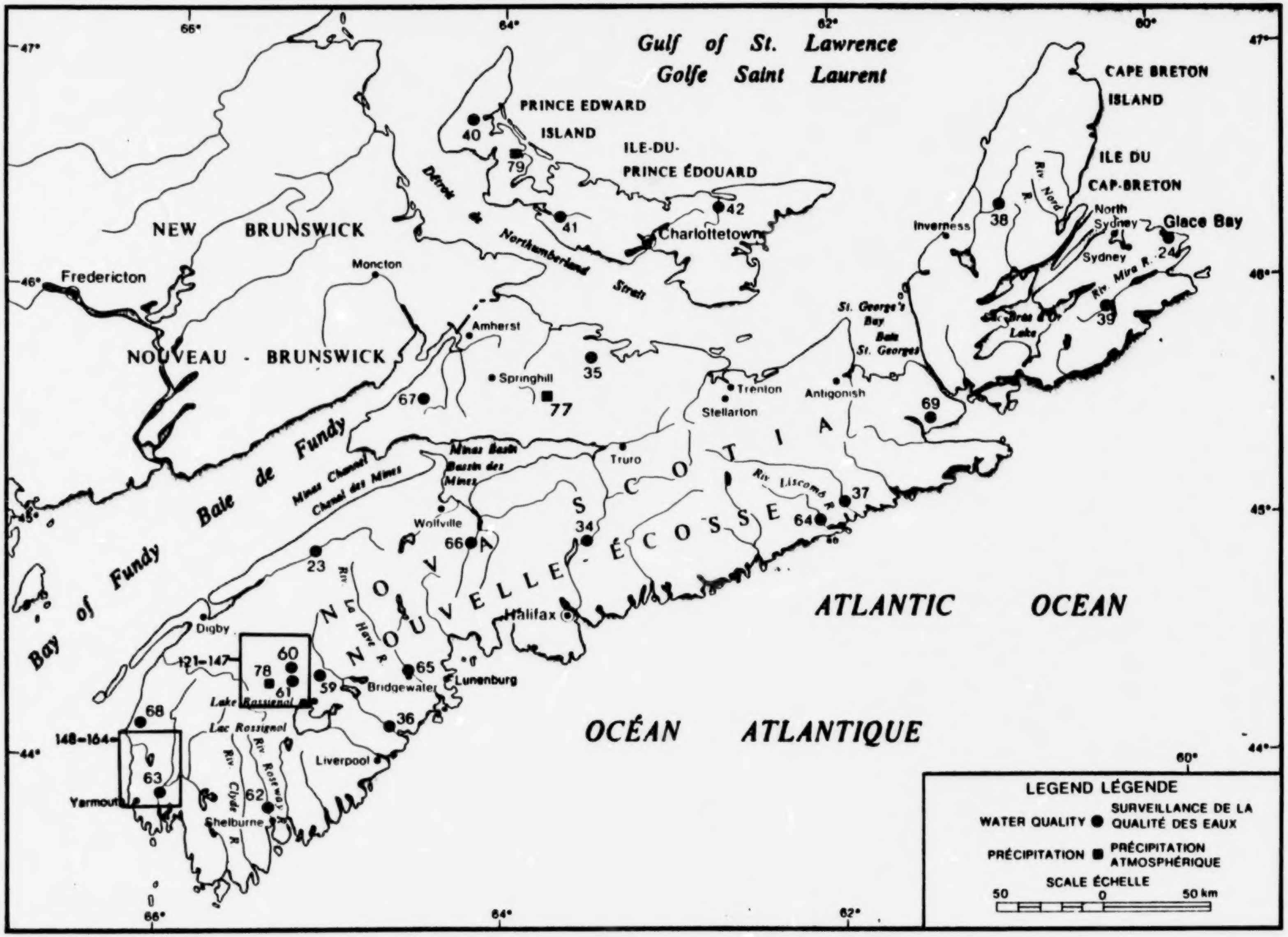

Gulf of St. Lawrence
Golfe Saint Laurent
PRINCE EDWARD ISLAND
ILE-DU-PRINCE ÉDOUARD
CAPE BRETON ISLAND
ILE DU CAP-BRETON
NEW BRUNSWICK
NOUVEAU - BRUNSWICK
NOVA SCOTIA
NOUVELLE-ÉCOSSE
Northumberland Strait
Détroit de Northumberland
Bay of Fundy
Baie de Fundy
Minas Channel
Chenal des Mines
Minas Basin
Bassin des Mines
St. George's Bay
Baie St. Georges
ATLANTIC OCEAN
OCÉAN ATLANTIQUE
Fredericton
Moncton
Amherst
Springhill
Truro
Trenton
Stellarton
Antigonish
Wolfville
Halifax
Lunenburg
Bridgewater
Liverpool
Shelburne
Yarmouth
Digby
Inverness
North Sydney
Sydney
Glace Bay
Charlottetown
Riv. Nord R.
Riv. Mira R.
Bras d'Or Lake
Riv. Liscomb R.
Riv. La Have R.
Lake Rossignol
Lac Rossignol
Riv. Clyde R.
Riv. Roseway R.
23
24
34
35
36
37
38
39
40
41
42
59
60
61
62
63
64
65
66
67
68
69
77
78
79
121–147
148–164
47°
46°
45°
44°
66°
64°
62°
60°
LEGEND LÉGENDE
WATER QUALITY ● SURVEILLANCE DE LA QUALITÉ DES EAUX
PRÉCIPITATION ■ PRÉCIPITATION ATMOSPHÉRIQUE
SCALE ÉCHELLE
50
0
50 km

FIGURE 2 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

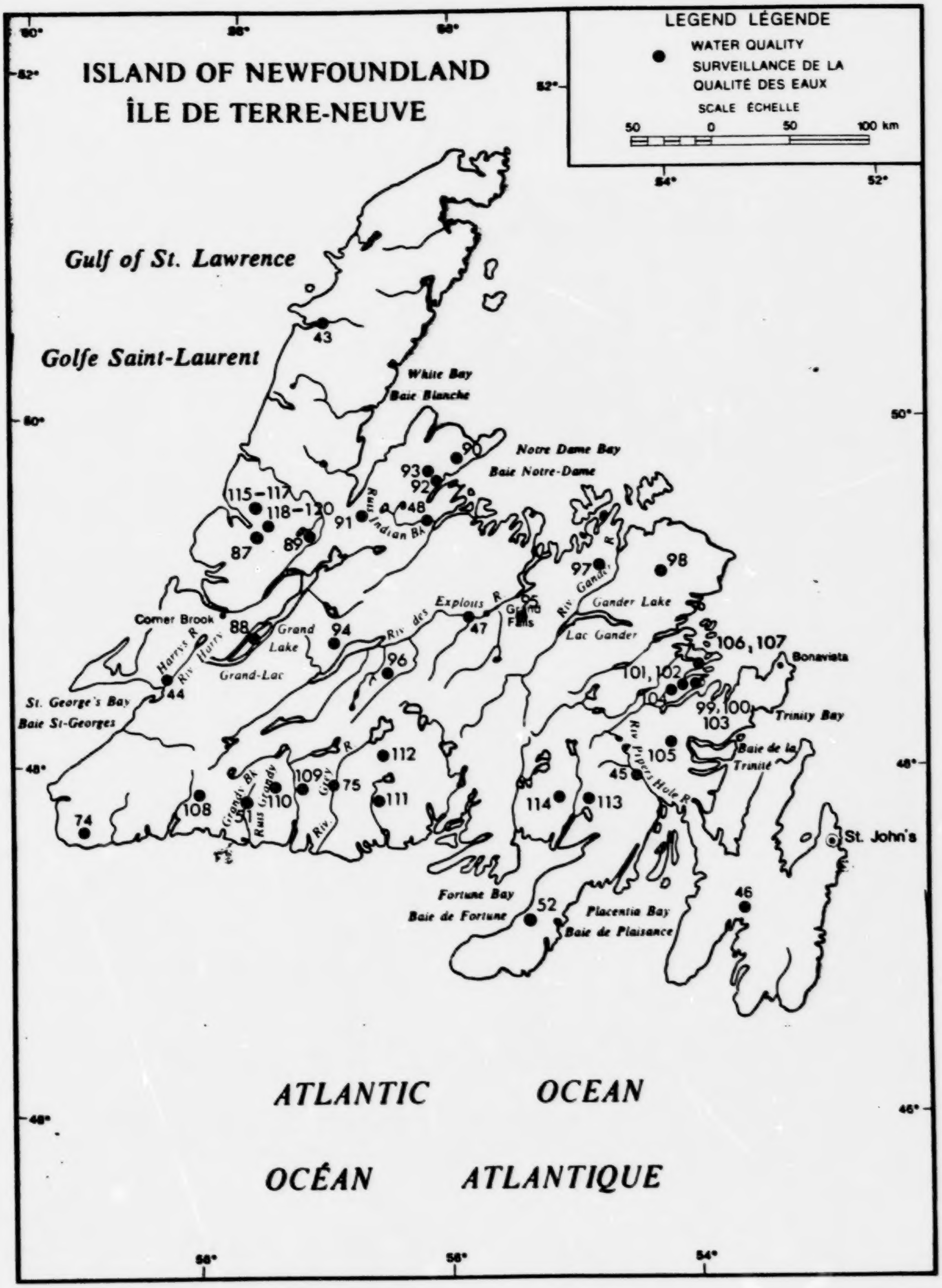

ISLAND OF NEWFOUNDLAND
ÎLE DE TERRE-NEUVE
LEGEND LÉGENDE
● WATER QUALITY
SURVEILLANCE DE LA QUALITÉ DES EAUX
SCALE ÉCHELLE
50 0 50 100 km
Gulf of St. Lawrence
Golfe Saint-Laurent
White Bay
Baie Blanche
Notre Dame Bay
Baie Notre-Dame
Corner Brook
Grand Lake
Grand-Lac
St. George's Bay
Baie St-Georges
Harrys R.
Riv. Harry
Indian Bk
Ruis. Indian
Riv. des Exploits
Exploits R.
Grand Falls
Gander Lake
Lac Gander
Riv. Gander
Gander R.
Bonavista
Trinity Bay
Baie de la Trinité
Pipers Hole R.
Riv.
St. John's
Grandy Bk
Ruis. Grandy
Grey R.
Riv. Grey
Fortune Bay
Baie de Fortune
Placentia Bay
Baie de Plaisance
ATLANTIC OCEAN
OCÉAN ATLANTIQUE
43
90
93
92
48
91
115-117
118-120
87
89
97
98
95
88
94
47
96
44
106, 107
101, 102
104
99, 100
103
105
45
112
109
75
110
51
108
111
74
114
113
52
46
60°
58°
56°
54°
52°
50°
48°
46°

FIGURE 3 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

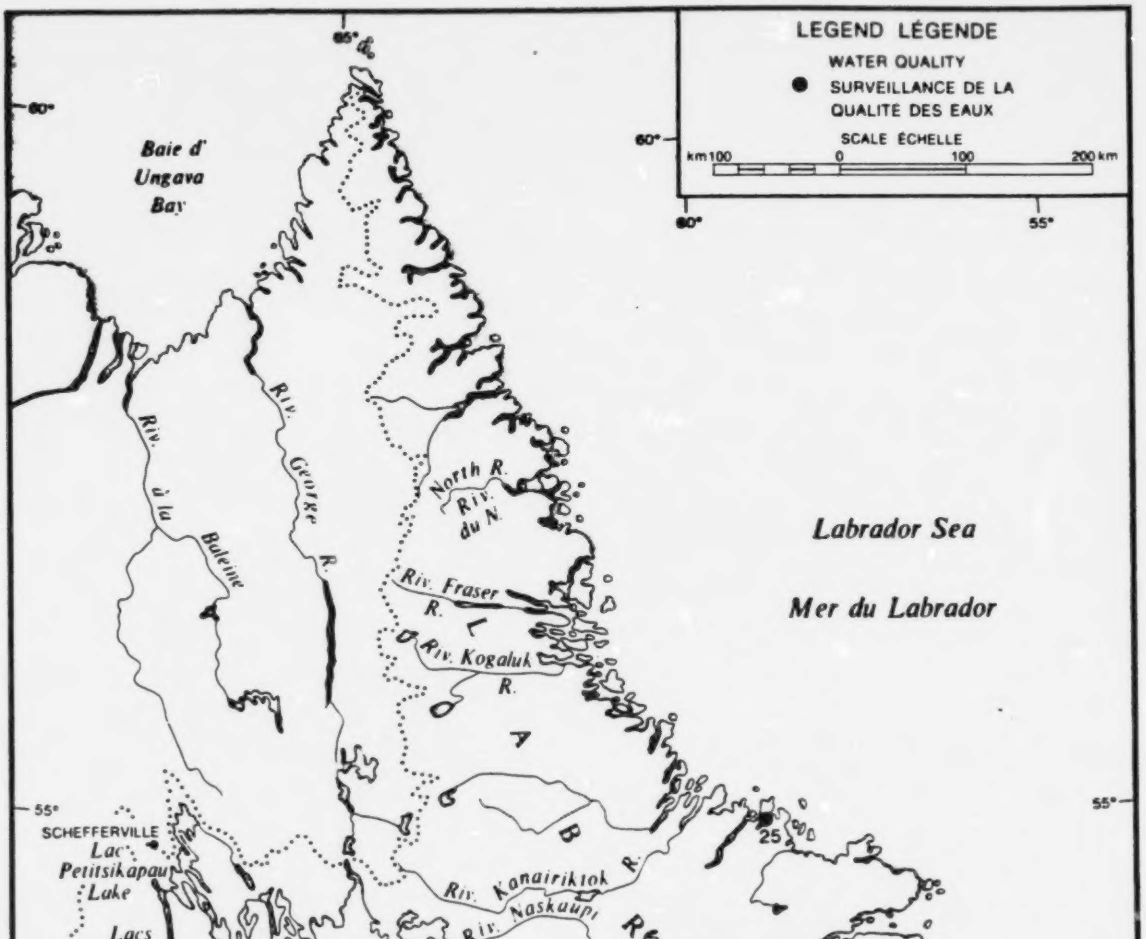

LEGEND LÉGENDE
● WATER QUALITY SURVEILLANCE DE LA QUALITÉ DES EAUX
SCALE ÉCHELLE
km 100
0
100
200 km
65°
60°
55°
50°
Baie d' Ungava Bay
Labrador Sea
Mer du Labrador
LABRADOR
Riv. à la Baleine
Riv. George R.
North R. Riv. du N.
Riv. Fraser R.
Riv. Kogaluk R.
Riv. Kanairiktok R.
Riv. Naskaupi R.
SCHEFFERVILLE
Lac Petitsikapau Lake
Lacs Menihek Lakes
Réservoir Smallwood Reservoir
Lac Grand Lake
Lac Melville Lake
Inlet Hamilton Inlet
Fleuve Churchill R.
GOOSE BAY
LABRADOR CITY
Lac Joseph Lake
Lac Atikonak Lake
Riv. du Petit Mecatina
Little Mecatina R.
Eagle R. Riv. de l'Aigle
Riv. St. Paul R.
Riv. St. Augustin R.
Lac Brûlé
Burnt Lake
Riv. Natashquan R.
Riv. Aguanus R.
Riv. Romaine R.
Str. of Bel. de Belle-Isle
25
49
50
Gulf of St. Lawrence
Golfe Saint-Laurent

FIGURE 4 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

D.2 Région du Québec

QUEBEC REGION

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET ______

TITRE DU PROJET: Entente Canada/Québec sur la qualité de l'eau

DUREE: En cours.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau.

CODE DU C&P 1.3

BUT: Mise en oeuvre et administration de l'entente CANADA/QUEBEC sur la surveillance continue de la qualité du milieu aquatique.

FONDEMENTS: L'entente sur la qualité de l'eau prévoit la concertation entre les deux gouvernements dans la surveillance de la qualité du milieu aquatique. L'entente permet également d'assurer un partage des coûts d'exploitation pour les stations dites d'intérêt fédéral-provincial.

En 1985/86, les deux parties ont procédé à une renégociation de l'entente sur la qualité de l'eau. En vertu de cette nouvelle entente, l'échantillonnage en 1986/87 couvrira au total 617 stations, dont 94 provinciales, 170 fédérales et 353 fédérales-provinciales. L'entente concerne trois programmes: les substances toxiques, les précipitations acides et la qualité des eaux.

DESCRIPTION DU PROJET:

1) Participer aux réunions du comité de coordination de l'entente (minimum 3 réunions par année).

2) Assurer le secrétariat du comité de coordination de l'entente et rédiger un rapport annuel pour le 31 août 1985.

3) Assurer l'échange avec la province des résultats d,échantillonnage faisant partie de l'entente (à réaliser conjointement avec l'administration centrale).

4) Assurer avec la province un contrôle de qualité au niveau des analyses en laboratoire (contrôle inter-laboratoire fédéral-provincial).

RESSOURCES ($'000)

A - P TECHN:	0
A - P PROF:	1,0
A - P TOTAL:	1,0

TRAITEMENTS:	37,6
FONCTIONNEMENT:	9,0
CONTRATS:	----
INVESTISSEMENTS:	----
SUBVENTION:	197,0
TOTAL:	243,6

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET ______

TITRE DU PROJET: Réseau du fleuve Saint-Laurent

DUREE: En cours.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau

CODE DU C&P 1.3

BUT: Exercer une surveillance de la qualité du milieu aquatique dans la partie fluviale du fleuve Saint-Laurent.

FONDEMENTS: Le fleuve Saint-Laurent draine plusieurs des régions les plus industrialisées d'Amérique du Nord, soit plus particulièrement la région internationale des Grands Lacs et la région métropolitaine de Montréal. Il est reconnu qu'il transporte des quantités non négligeables de substances nutritives et/ou toxiques.

DESCRIPTION DU PROJET:

1) Echantillonner 4 fois 26 stations de base de réparties entre Cornwall et l'île d'Orléans.

2) Echantillonner 4 fois 20 stations satellites situées dans le lac Saint-Pierre et le delta de Sorel.

3) Echantillonner 4 fois 8 stations satellites situées dans la zone d'influence de l'émissaire de la Communauté Urbaine de Montréal.

4) Effectuer au laboratoire régional (Longueuil) les analyses des échantillons récoltés pour les tests physiques, les éléments nutritifs et les ions majeurs, de même que certains échantillons pour la bactériologie.

5) Faire analyser par le laboratoire central (Burlington) les échantillons récoltés pour les métaux lourds et pour les substances toxiques.

6) Valider les résultats d'analyse et les acheminer dans la base de données NAQUADAT.

7) Rédiger pour décembre 1986 un rapport technique sur la variabilité spatiale de la qualité de l'eau du fleuve Saint-Laurent à partir des résultats de 77 stations échantillonnées en 1983/84.

8) Rédiger pour mars 1987 un rapport technique à partir des résultats obtenus dans la zone d'influence de l'émissaire de la C.U.M.

9) Parrainer une proposition spontanée sur l'analyse des tendances temporelles de l'évolution de la qualité de l'eau du fleuve à partir des données disponibles depuis 1950 à la DGEI-Q et des données de qualité des effluents disponibles au Service de Protection de l'Environnement.

RESSOURCES: ($'000)

A - P TECHN:	
A - P PROF:	
A - P TOTAL:	2,4
TRAITEMENTS:	90,1
FONCTIONNEMENTS:	36,0
CONTRATS:	8,0
INVESTISSEMENTS:	41,5
TOTAL:	175,6

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET ______

TITRE DU PROJET: Réseau Transfrontalier Canada - Etats-Unis

DUREE: En cours.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau

CODE DU C&P 1.3

BUT: Exercer une surveillance de la qualité du milieu aquatique dans des cours d'eau transfrontaliers entre le Québec et les Etats-Unis.

FONDEMENTS: La surveillance de la qualité des eaux transfrontalières permet d'identifier les problèmes de pollution chimique et/ou organique dans ces eaux. Le territoire étudié couvre des rivières situées aux frontières entre le Québec et les états du New York, Vermont et New Hampshire.

DESCRIPTION DU PROJET:

1) Echantillonner 4 fois 12 station situées le long du 45^{e} parallèle entre le Québec et l'état de New-York.

2) Effectuer au laboratoire régional (Longueuil) les analyses des 48 échantillons récoltés pour les tests physiques, les éléments nutritifs et les ions majeurs.

3) Faire analyser par le laboratoire central (Burlington) les 48 échantillons récoltés pour les métaux lourds.

4) Valider les résultats d'analyse et les acheminer dans la base de données NAQUADAT.

5) Publier pour Décembre 1986 un rapport sur la qualité de l'eau de la baie Missisquoi à partir des données récoltées en 1983/84.

RESSOURCES: ($'000)

A - P TECHN:	
A - P PROF:	
A - P TOTAL:	0,6
TRAITEMENTS:	22,6
FONCTIONNEMENT:	6,0
CONTRATS:	
INVESTISSEMENTS:	
TOTAL	28,6

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET ______

TITRE DU PROJET: Réseau TDPA (LRTAP)

DUREE: En cours depuis 1983

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité des eaux — CODE DU C&P 1.3
Transport à Distance des polluants atmosphériques — CODE DU C&P 4.2

BUTS: Contribuer à exercer une surveillance de l'évolution de l'acidification des eaux de surface au Québec et à déceler des modifications éventuelles de cette évolution suite à la réduction d'émissions à la source.

FONDEMENTS: Les inventaires physico-chimiques réalisés depuis 1980 dans les cours d'eau du Québec par divers organismes (DGEI-Q, Pêches et Océans, INRS-Eau, MENVIQ) ont démontré que le Québec est particulièrement vulnérable aux précipitations acides. Le réseau TDPA est en place depuis Juin 1983 et il a été planifié par le programme de Planification et Gestion de la DGEI-Q. Il est opéré depuis avril 1985 par le personnel de la Qualité de l'eau. En 1986/87, le réseau est extensionné dans la région de Pontiac Témiscamingue, ou six (6) nouveaux lacs seront échantillonnés sur une base temporelle.

DESCRIPTION DU PROJET:

1) Opérer un réseau d'échantillonnage mis en place depuis Juin 1983; échantillonner 6 fois 16 stations temporelles et 2 fois 23 stations spatiales.

2) Effectuer au laboratoire régional (Longueuil) les analyses des 154 échantillons récoltés pour les tests physiques, les ions majeurs et les éléments nutritifs.

3) Faire analyser par le laboratoire central (Burlington) les 154 échantillons récoltés pour les métaux lourds.

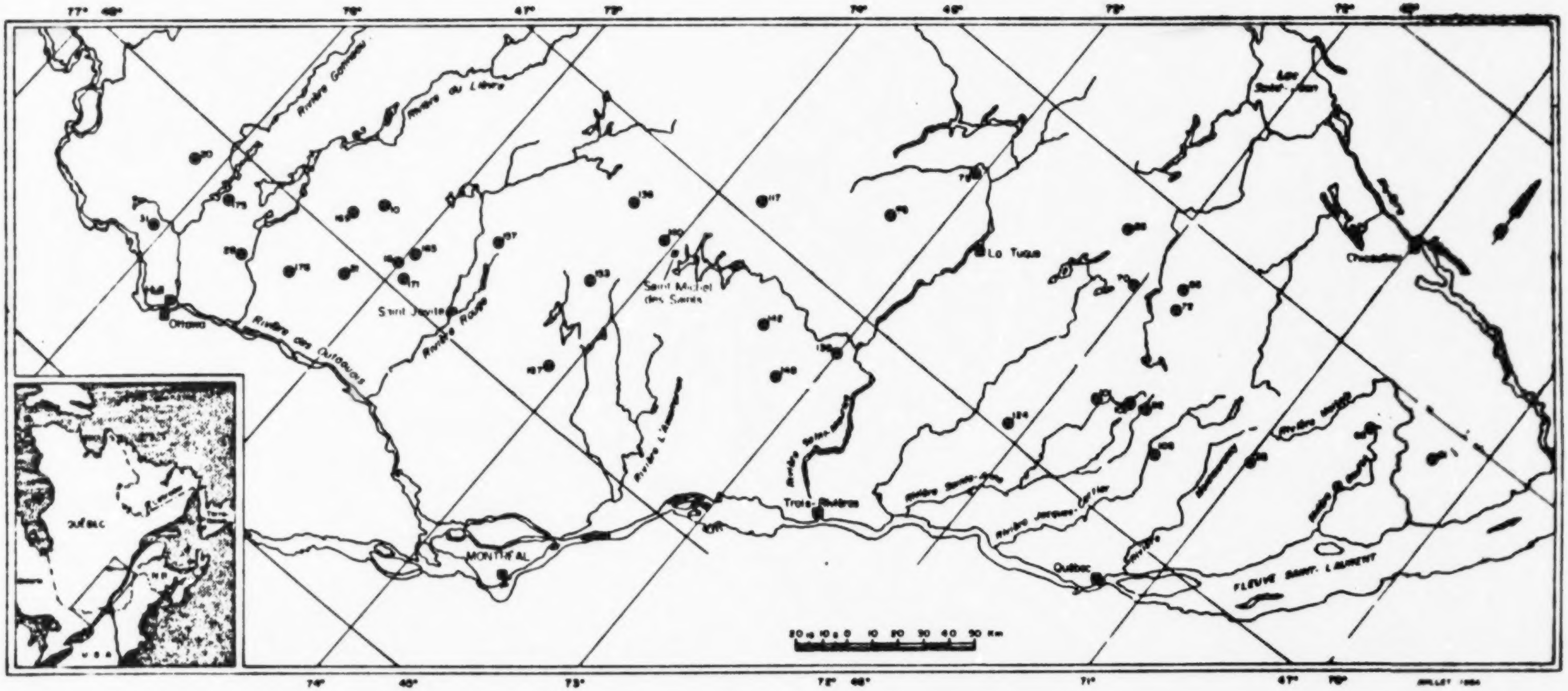
4) Valider les résultats d'analyse et les acheminer dans la base de donnée NAQUADAT.

5) Participer au programme d'études comparatives inter-laboratoires du C.C.E.I. pour les projets sur les précipitations acides.

RESSOURCES: ($'000) *

A - P TECHN:	
A - P PROF:	
A - P TOTAL:	1,0
TRAITEMENTS:	37,6
FONCTIONNEMENT:	80,0
CONTRATS:	
INVESTISSEMENT:	
TOTAL	117,6

* Les années-personnes proviennent du programme 1,3 alors que les dépenses de fonctionnement proviennent du programme 4,2.


Rivière Gatineau
Rivière du Lièvre
Ottawa
Rivière des Outaouais
Saint Jovite
Rivière Rouge
Saint Michel des Saints
Rivière L'Assomption
MONTRÉAL
Trois-Rivières
Rivière Saint-Maurice
La Tuque
Rivière Sainte-Anne
Rivière Jacques-Cartier
Québec
FLEUVE SAINT-LAURENT
Lac Saint-Jean
Chicoutimi
QUÉBEC
U.S.A.
0 10 20 30 40 50 Km
77°
74°
73°
72°
71°
70°

● No du lac ▪ ville

Fig. 6 LOCALISATION DES STATIONS D'ECHANTIONNAGE DU RESEAU TDPA 1986-87

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET ______

TITRE DU PROJET: Réseau du Nouveau-Québec

DUREE: En cours depuis 1983.

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité des eaux

CODE DU C&P 1.3

BUTS: Acquérir des données de base sur la qualité de l'eau au Nouveau-Québec et développer un réseau d'échantillonnage pour assurer une surveillance de la qualité du milieu aquatique au nord du 55^{e} parallèle.

FONDEMENTS; Pour assurer une surveillance continue de la qualité de l'eau de l'ensemble du territoire québécois, il s'avérait nécessaire qu'un réseau d'échantillonnage soit établi pour couvrir la partie septentrionale du Québec. Compte tenue que les réseaux du MENVIQ concernent des cours d'eau situés exclusivement au sud du 52^{e} parallèle et que la Société d'Energie de la Baie James effectue une surveillance dans le territoire dela Baie James, le réseau du Nouveau-Québec a été établi prioritairement au nord du 55^{e} parallèle.

DESCRIPTION DU PROJET:

1) Avec la collaboration de la direction des relevés aquatiques de Environnement Québec, échantillonner 2 fois 15 stations sur des rivières se déversant dans la baie d'Ungava et la baie d'Hudson.

2) Effectuer au laboratoire régional (Longueuil) les analyses des 30 échantillons récoltés pour les tests physiques, les éléments nutritifs et les ions majeurs.

3) Faire analyser par le laboratoire central (Burlington) les 30 échantillons pour les métaux lourds et les substances organiques (PCB/OC).

4) Valider les résultats d'analyse et les acheminer dans la base de données NAQUADAT.

5) Préparer un rapport préliminaire à partir des résultats obtenus entre mars 1983 et octobre 1985.

RESSOURCES: ($'000)

A - P TECHN:	
A - P PROF:	
A - P TOTAL:	0,4
TRAITEMENTS:	15,0
FONCTIONNEMENT:	4,0
CONTRATS:	
INVESTISSEMENT:	
TOTAL:	19,0

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET ______

TITRE DU PROJET: Contribution au programme d'études du lac Laflamme (TDPA)

DUREE: En cours

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau

CODE DU C&P: 1.3

BUTS: Soutien analytique approprié pour le programme d'études entrepris par la DGEI-Q au lac Laflamme sur les effets des précipitations acides sur l'écosystème aquatique.

FONDEMENTS: La DGEI-Q poursuit depuis quelques années un programme de recherche au lac Laflamme sur les précipitations acides. Ce bassin versant calibré fait l'objet de recherches multidisciplinaires par plusieurs organismes (DGEI-Q, Centre de Recherche Forestière des Laurentides, Ministère des Pêches et Océans, Université Laval). Tous les travaux visent à circonscrir les effets des précipitations acides sur l'écosystème aquatique des forêts boréales.

DESCRIPTION DU PROJET:

1) Effectuer au laboratoire régional (Longueuil) l'analyse des 104 échantillons récoltés annuellement pour les tests physiques, les éléments nutritifs et les ions majeurs.

2) Valider les résultats d'analyse et les acheminer au chargé de projet.

RESSOURCES: ($'000)

A - P TECHN:	
A - P PROF:	
A -P TOTAL:	0,4
TRAITEMENTS:	18,8
FONCTIONNEMENT:*	
CONTRATS:	
INVESTISSEMENTS:	
TOTAL:	32,8

* Les dépenses de fonctionnement sont comptabilisés au projet du réseau TDPA (LRTAP)

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET

TITRE DU PROJET: Contrôle de Qualité.

DUREE: En cours

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité de l'eau

Code du C&P 1.3

BUTS: Assurer un contrôle de qualité approprié pour les analyses effectuées en laboratoire et les procédures d'échantillonnages pour les différents programmes.

FONDEMENTS: La validité et l'interprétabilité des données de qualité de l'eau sont grandement conditionnées par la qualité des résultats fournis par les équipes de terrain et de laboratoire.

DESCRIPTION:

1) Participer aux différents contrôles interlaboratoires pour les projets de la DGEI-Q (contrôle fédéral-provincial et contrôle pour les précipitation acides).

2) Effectuer les contrôles intra-laboratoires requis (triplicata, solutions de référence NBS ou EPA, etc.).

3) Respecter les mesures de contrôle pour le terrain et le laboratoire identifiées dans le plan de contrôle de la qualité pour la région du Québec.

RESSOURCES ($000):

A - P TECHN:	
A - P PROF:	
A - P TOTAL:	0,4
TRAITEMENTS:	15,0
FONCTIONNEMENT:	7,0
CONTRATS:	--
CAPITAL:	--
TOTAL	22,0

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION Québec
NUMERO DU PROJET ______

TITRE DU PROJET: Objectif de qualité de l'eau de la rivière des Outaouais.

DUREE: En cours depuis 1985/86

NOM DU PROGRAMME NATIONAL: Gestion des données sur la qualité des eaux — Code du C&P 1.3

BUT: Soutien approprié à l'élaboration des objectifs de qualité de l'eau de la rivière des Outaouais.

FONDEMENTS: Le comité de coordination sur la qualité de l'eau de la rivière des Outaouais regroupe depuis quelques années déjà des représentants fédéraux et provinciaux. Leur mandat est de définir certains objectifs de qualité de l'eau en fonction des divers usages de la rivière.

DESCRIPTION DU PROJET:

1) Participer à un comité technique de travail chargé entre autre de développer ou d'évaluer les objectifs fixés pour la qualité de l'eau.

RESSOURCES: ($'000)

A-P techn.	0
A-P prof	0,1
A-P TOTAL	0,1
TRAITEMENTS:	3,7
FONCTIONNEMENT	--
CONTRATS	--
INVESTISSEMENT	--
TOTAL$	3,7

DESCRIPTION DU PROJET
DIRECTION DE LA QUALITE DES EAUX
1986/87

REGION	Québec
NUMERO DU PROJET	ST-86

TITRE DU PROJET: Dissémination des substances toxiques dans le fleuve Saint-Laurent.

NOM DU PROGRAMME NATIONAL: Produits chimiques-toxiques Code du C&P 4.1

BUTS:

1. Dans le fleuve Saint-Laurent, recueillir des données sur les substances toxiques incluant les pesticides, les analyser, les interpréter et les rendre adéquates pour fins d'utilisation et d'interprétation.

2. Caractériser la présence et l'acheminement des substances toxiques provenant des Grands Lacs et du tronçon international du fleuve Saint-Laurent d'une part, et provenant du tronçon Montréal-Sorel d'autre part.

3. Etablir une base de données sur la présence des pesticides au Québec afin de fournir de l'information dans le cadre de la réévaluation des produits en usage.

FONDEMENTS: La dissémination des produits chimiques toxiques a été identifiée comme problème majeure dans le fleuve Saint-Laurent, tandis que l'apport des pesticides provenant des bassins agricoles est encore peu connu.

DESCRIPTION:

1) Prélever des sédiments de fond à quarante stations dans le lac Saint-Pierre; effectuer des analyses chimiques (à contrat et au laboratoire national) et biologiques ("in house"). Acquérir de l'expertise dans les analyses biologiques (élutriation, bioessais) des sédiments.

2) Collaborer avec l'INRE et l'Université de Montréal et coordonner les travaux de recherche axés sur l'évaluation des substances toxiques dans les sédiments du fleuve Saint-Laurent.

3) Faire la compilation des données sur les sédiments du lac Saint-Louis et en faire une interprétation préliminaire.

4) Rédiger un rapport d'interprétation sur la contamination des poissons (Hg, PCB) provenant des lacs Saint-Louis et Saint-François.

5) Faire effectuer au moyen d'un contrat le prélèvement des jeunes poissons à environ 10 stations dans le lac Saint-Pierre; faire effectuer des analyses des produits toxiques au laboratoire national et à contrat.

6) Echantillonner une fois des sédiments en suspension au moyen d'un centrifugeuse en continu et extraire les substances chimiques toxiques au moyen de la colonne Seastar à 6 stations dans le fleuve Saint-Laurent (3 stations à Lanoraie et 3 stations à Trois-Rivières) à l'automne 1986; faire effectuer les analyses à contrat.

7) Développer une méthode au moyen d'un bio-test pour détecter la présence des pesticides dans l'eau (parrainage d'une proposition spontannée).

RESSOURCES ($000):

A - P	3,2
Traitement:	148,0
Fonctionnement:	77,6
Contrat:	45,0
Investissement:	6,5
TOTAL	277,1

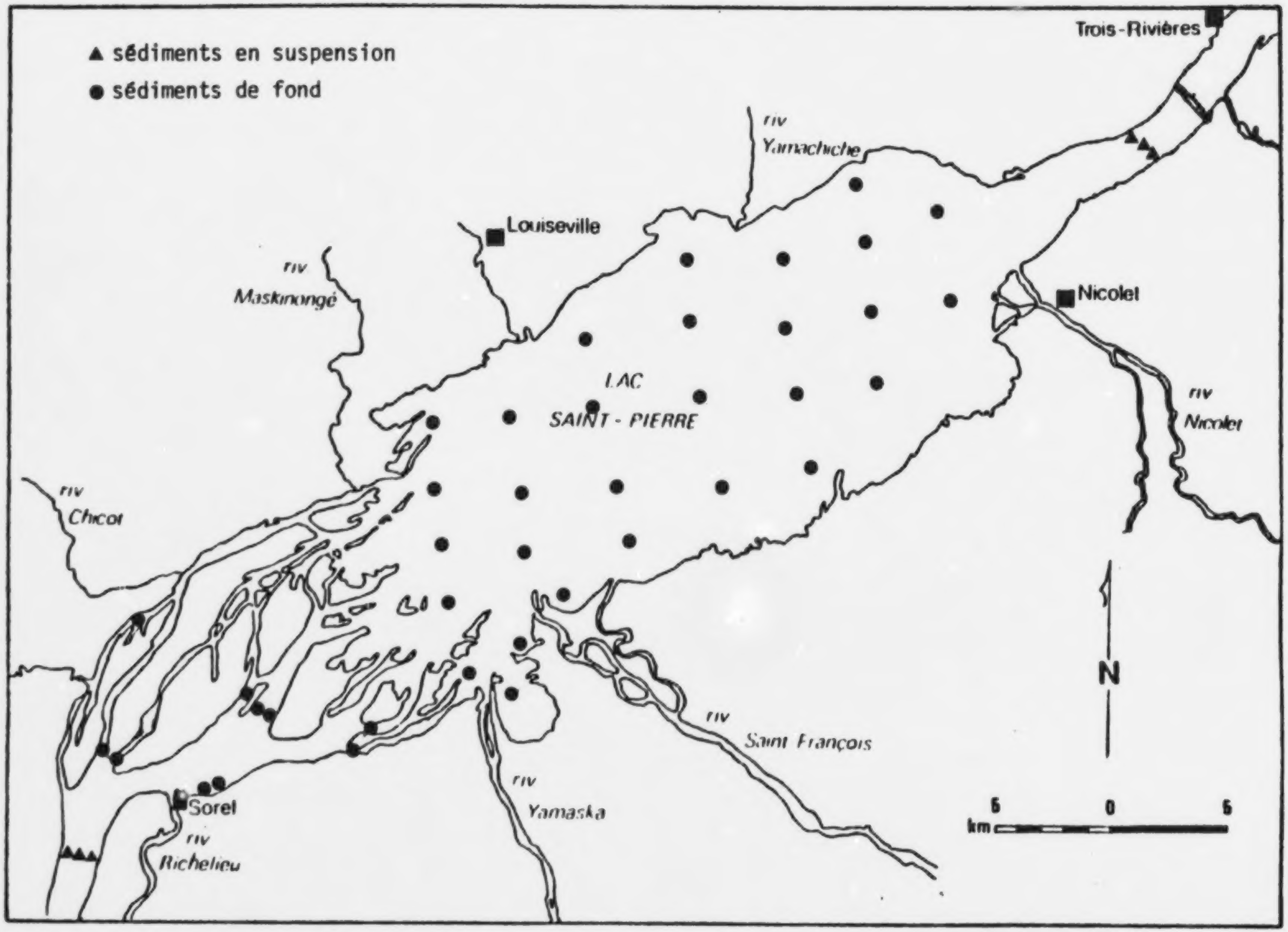

▲ sédiments en suspension
● sédiments de fond
Trois-Rivières
riv Yamachiche
Louiseville
riv Maskinongé
Nicolet
riv Nicolet
LAC SAINT-PIERRE
riv Chicot
N
riv Saint François
Sorel
riv Yamaska
riv Richelieu
5 0 5
km

Fig. 7 LOCALISATION DES STATIONS DE SEDIMENT DU TRONCON DU LAC SAINT-PIERRE

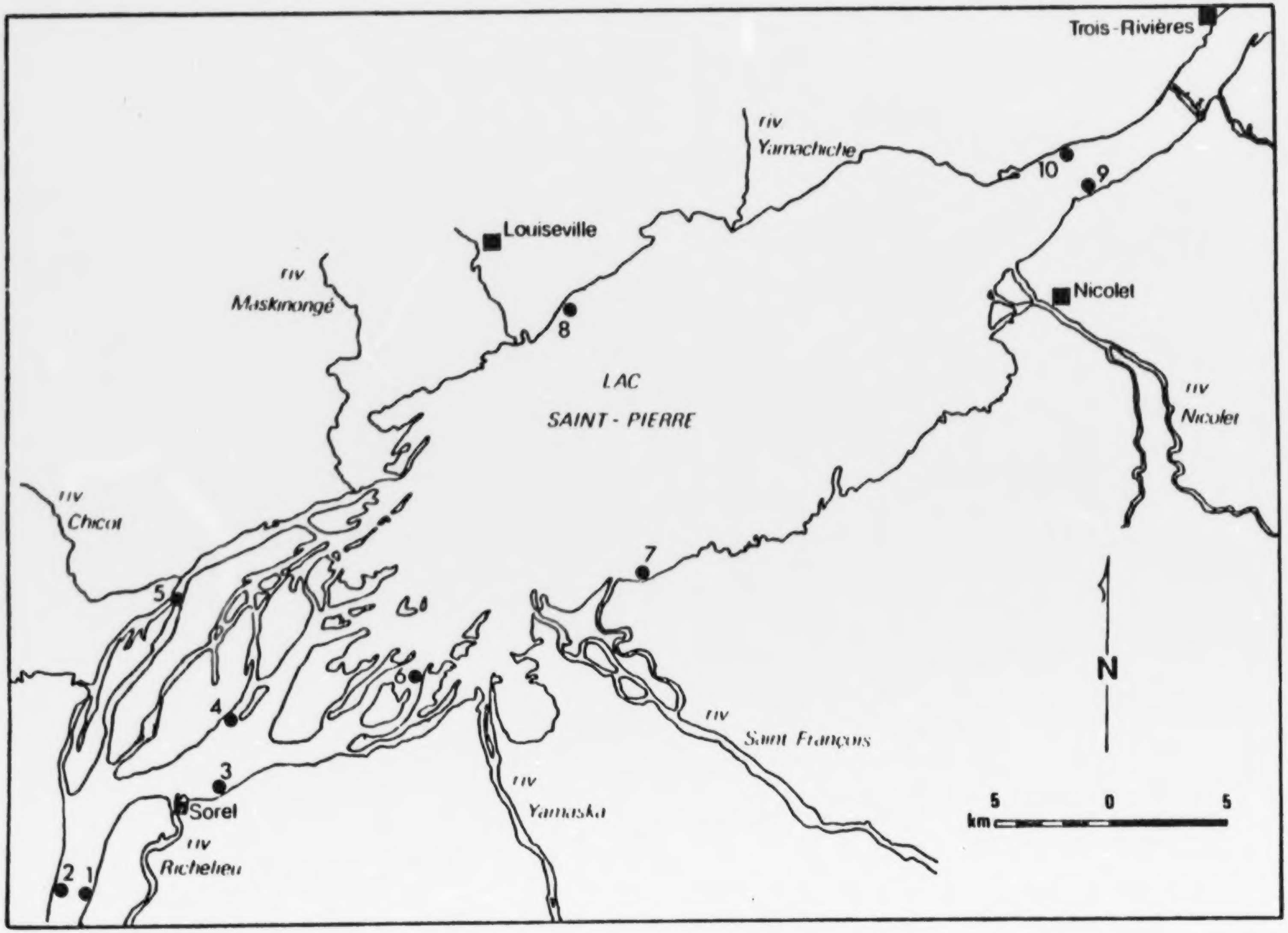

Trois-Rivières
riv
Yamachiche
10
9
Louiseville
riv
Maskinongé
8
Nicolet
LAC
SAINT - PIERRE
riv
Nicolet
riv
Chicot
7
5
N
6
4
riv
Saint François
3
Sorel
riv
Yamaska
5
0
5
km
riv
Richelieu
2
1

Fig.8 LOCALISATION DES STATIONS DES JEUNES POISSONS DU TRONCON DU LAC SAINT-PIERRE (MSP)

QUALITE DES EAUX

c) Réseau-rivières (fédérales-provinciales):

NUMERO		DESCRIPTION	COORDONNEES UTM		
NAQUADAT	BQMA		ZONE	EST	NORD
	01150003	Matapédia au pont Mercier à Matapédia	19	653200	5315300
	01150004	Matapédia au pont-route à 2,0 km en amont du lac au Saumon	19	621150	5366100
	01170001	Madawaska au pont-route à Dégelis	19	527250	5266200
	02340006	Chaudière au point en amont de la Droiet au sud-ouest de Saint-Ludger	19	360900	5061050
	02340033	Chaudière à la prise d'eau de Charny	19	325900	5174200
	02400004 *	Bécancour au pont-route 132 à Bécancour	18	697000	5136200
	03010008 *	Nicolet au pont-route 226 à Sainte-Monique	18	690100	5113900
	03020031	Saint-François au pont-route 132 à Pierreville	18	668900	5103650
	03020037	Magog au pont-route 55 à l'est de Magog	18	727250	5017250
	03020083	Saint-François au barrage hydroélectrique au sud de Weedon-centre	19	308100	5059200
	03030023 *	Yamaska au pont-route à Yamaska	18	661700	5096500
	03030031 *	Yamaska sud-est à 3,2 km de son embouchure avec la Yamaska à l'est de Farnham	18	662900	5014900
	03040009	Richelieu à l'usine de filtration de Sorel	18	644800	5097300
	03040012	Richelieu au pont du CN à l'est de Lacolle	18	631250	4990900
	03040015	Aux Brochets au pont-route 133 à Pike River	18	651800	4998250

QUALITE DES EAUX (suite)

c) Réseau-rivières (fédérales-provniciales):

NUMERO		DESCRIPTION	COORDONNEES UTM		
NAQUADAT	BQMA		ZONE	EST	NORD
	03090001	Châteauguay au pont-route 205 au nord de Sainte-Martine	18	593900	5015200
	03090005	Châteauguay à 1,6 km en aval du pont Powerscourt	18	565700	4985100
	04010002 *	Du Nord au pont-route 344 à Saint-André-est	18	551700	5045450
	04020001	Rouge au pont-route 148 à l'ouest de Calumet	18	524100	5054300
	04040001	De la Petite Nation au pont-route 148 à l'ouest de Plaisance	18	490050	5049950
	04060004	Du Lièvre au pont-route à Buckingham	18	467300	5047900
	04080003	Gatineau au pont-route en amont du ruisseau Chelsea au nord de Gatineau	18	441450	5037100
	04080005	Gatineau au pont-route 107 à Maniwaki	18	425650	5136850
	04130002	Coulonge au pont-route 148 à Fort-Coulonge	18	365700	5078650
	04300002	Kinojevis au pont-route 117 à l'est de McWatters	17	658700	5341400
	04300003	Beauchastel au pont-rouge à 1 km de son embouchure avec le lac Bruère	17	650500	5335950
	04310002	Des Outaouais au barrage de Carillon	18	548100	5046000
	04310008	Des Outaouais au barrage Chenaux	18	369300	5049000
	04310009	Des Outaouais au pont-route 101 à Témiscaming	17	645150	5174650
	04310010	Des Outaouais au pont-route 101 à Notre-Dame-du-Nord	17	613900	5271550
	04310011	Des Outaouais à la traverse de Masson	18	467900	5040900

QUALITE DES EAUX (suite)

c) Réseau-rivières (fédérales-provniciales):

NUMERO		DESCRIPTION	COORDONNEES UTM		
NAQUADAT	BQMA		ZONE	EST	NORD
	05010007	Saint-Maurice à l'usine de filtration de Trois-Rivières	18	683750	5139050
	05010013	Saint-Maurice au barrage de la Tuque	18	665850	5256800
	05080006	Jacques-Cartier au pont-route à l'embouchure à Donnacona	19	289550	5172900
	05220003	L'Assomption au pont-route à Le Gardeur	18	619100	5067300
	06220001	Péribonca au pont-route 169 à Sainte-Monique	19	290000	5402700
	06290002	Saguenay au pont-route à Chicoutimi	19	346850	5366250
	07100001	Aux Outardes à la centrale Outardes-2 à Chûte-aux-Outardes	19	544500	5442000
	07110001 *	Manicouagan au pont-route 138 à l'ouest de Hauterive	19	549400	5448550
	07230003	Moisie au pont-route 138 au nord de Moisie	19	711600	5572200
	08070028	Bell au pont-route 113 à Rapides-des-Cèdres	18	3490100	5430500

* Nouvelles stations en 1986/87

Réseau du fleuve Saint-Laurent - Localisation des stations échantillonnées en 1986/87, réseau de base

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION Stations de base
1	05QU02LB9001	Rivière des Outaouais sur le barrage de Carillon
2	00QU02OA9002	Rivière des Outaouais, canal Sainte Anne à Sainte Anne-de-Bellevue sous la route 20
3	00QU02MC9007	Fleuve Saint-Laurent, canal de Beauharnois à Valleyfield, pont de la route 132, au centre de la voie navigable (00QU02MC0136)
10	00QU02OB9016	Fleuve Saint-Laurent à 25 m du quai de Lanoraie
11	00QU02OJ9017	Fleuve Saint-Laurent à 50 m de la rive sud en face de Lanoraie
12	00QU02NG9019	Fleuve Saint-Laurent sous le pont Laviolette à Trois-Rivières, côté nord, entre le deuxième et le troisième pilier
13	00QU02OD9020	Fleuve Saint-Laurent sous le pont Laviolette à Trois-Rivières, côté sud, entre le deuxième et le troisième pilier
14	00QU02OD9026	Fleuve Saint-Laurent au centre du pont Laviolette à Trois-Rivières, (voie navigable)
15	00QU02OJ9027	Fleuve Saint-LAurent au centre de la voie navigable en face de Lanoraie
16	00QU02OA9028	Fleuve Saint-Laurent à la prise d'eau de l'usine de filtration de Montréal (Charles J. Desbaillet)
27	00QU02PK9058	Fleuve Saint Laurent, à 30 m du quai de Leclercville
28	00QU02PC9060	Fleuve Saint-Laurent, voie navigable, près de la bouée rouge D12 en face de Leclerville
29	00QU02PC9061	Fleuve Saint-Laurent, à 30 m du quai de Saint-Charles-de-Grondines
30	00QU02PH9062	Fleuve Saint-Laurent entre l'île d'Orléans et la rive sud (partie sud)
31	00QU02PH9063	Fleuve Saint-Laurent entre l'île d'Orléans et la rive sud (au centre)

Réseau du fleuve Saint-Laurent - Localisation des stations échantillonnées en 1986/87, réseau de base (suite)

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION	Stations de base
32	00QU02PH9064	Fleuve Saint-Laurent entre l'île d'Orléans et la rive sud (partie nord)	
33	00QU02PE9065	Fleuve Saint-Laurent entre l'île d'Orléans et la rive nord (partie sud)	
34	00QU02PE9066	Fleuve Saint-Laurent entre l'île d'Orléans et la rive nord (au centre)	
35	00QU02PE9067	Fleuve Saint-Laurent entre l'île d'Orléans et la rive nord (partie nord)	
39	00QU02MC9201	Fleuve Saint-Laurent, au lac Saint-François, face à l'usine d'épuration de Cornwall à 250 m de la rive	
40	00QU02MC9202	Fleuve Saint-Laurent, au lac Saint-François, près de la bouée du diffuseur de Cornwall à 325 m en amont de l'île Pilon	
41	00QU02MC9203	Fleuve Saint-Laurent, au lac Saint-François, entre les îles Cornwall et Pilon, voie navigable, à 550 m au nord de l'île Cornwall	
42	00QU02MC9204	Fleuve Saint-Laurent, au lac Saint-François, à 200 m au sud de l'île Cornwall vis-à-vis de la bouée rouge D96	
43	00QU02MC9205	Fleuve Saint-Laurent, au lac Saint-François, voie navigable, au sud de l'île Cornwall, en amont des bouées D95 et D96	
44	00QU02MC9206	Fleuve Saint-Laurent, au lac Saint-François, à 250 m au nord de la réserve Saint-Régis à l'extrême ouest	
45	00QU02MC9207	Embouchure de la rivière Saint-Régis 30 m en amont de l'île Mud, sur la frontière Canada-Etats-Unis	

QUALITE DES EAUX (suite)

d) Réseau fleuve Saint-Laurent:

NUMERO DE LA STATION NAQUADAT	DESCRIPTION DE LA STATION	COORDONNEES UTM ZONE	EST	NORD
00QU020J9073:	Fleuve Saint-Laurent, côté nord de l'île Beauregard, à mi-chemin des berges	18		

Stations satellites (Lac Saint-Pierre):

Vingt (20) stations seront situées dans le lac Saint-Pierre, plus précisement entre Sorel et Trois-Rivières.
La localisation précise reste à déterminer.

Réseau du fleuve Saint-Laurent - Localisation des stations échantillonnées en 1986-87 pour l'émissaire de la C.U.M.

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION	Stations de base
7	00QU020A9013	Fleuve Saint-Laurent entre Grande Ile et la rive sud (près de Boucherville) à 600 m de l'île sous la ligne de transmission	
8	00QU020A9014	Fleuve Saint-Laurent entre l'île au Veau et Pointe-aux-Trembles sous la ligne de transmission à 400 m de l'île	
9	00QU020J9015	Fleuve Saint-Laurent à 300 m en aval de l'île Evers (près de Varennes) entre l'île aux Cerfeuils et l'île des Lauriers	
18	00QU020A9031	Fleuve Saint-Laurent entre l'île au Veau et Grande Ile au centre de la voie navigable sous la ligne de transmission	
24	00QU020J9039	Fleuve Saint-Laurent à 100 m de la rive nord, près de Repentigny	
25	00QU020J9040	Fleuve Saint-Laurent à 200 m en amont de l'île Beauregard (cap Saint-Michel) au centre du fleuve	
26	00QU020B9041	Fleuve Saint-Laurent à 100 m en avail de l'île Hertel (près du cap Saint-Michel au centre de la voie navigable)	

Réseau Transfrontalier - Localisation des stations prévues en 1986-87

Numéro de référence sur la carte	Numéro de la station NAQUADAT	DESCRIPTION	Stations de base
60	00QU020E9101	Ruisseau Hall à environ 1 km au nord de Comins Hill	
61	00QU020E9102	Ruisseau Leach à Hereford sur le pont menant à Hereford Hill	
62	00QU020E9107	Rivière Coaticook sous le pont de la voie ferrée en arrière des douanes des USA	
63	00QU020E9108	Rivière Tomifobia sur le pont de la route entre Judge Mills et Baldwin Mills	
64	00QU020E9113	Rivière Tomifobia à la limite ouest de Rock Island sur la route 247 face à la maison 139	
65	00QU020H9116	Rivière Missisquoi près des douanes de Highwater, sud du ruisseau Mud	
66	00QU020H9117	Rivière Missisquoi sous le pont de la frontière à East Richford	
67	00QU020H9118	Rivière Sutton sous le pont de la route 139 à Abercorn	
68	00QU020H9119	Rivière aux Brochets sous le pont de la route 237 au sud de Frelighsburg, (premier au nord des douanes)	
69	00QU020H9161	Rivière de la Roche à son entrée au Québec sur la frontière	
70	00QU020A9143	Rivière à la truite sur la route 138 au sud de Kensington (aux douanes)	
71	00QU02MC9144	Rivière aux Saumons sur le quai en béton aux douanes de Dundee	

Réseau Nouveau-Québec (provinciales et fédérales):

Numéro de référence sur la carte	Numéro de la station NAQUADAT	Description	Coordonnées UTM		
			Zone	Est	Nord
80	00QU03MC9404	Rivère à la Baleine, à 40,2 km de l'embouchure (à 7,7 km en amont de la Chaumaux)	19	587600	6408300
81	00QU03LF9402	Rivière Caniapiscau, à la tête de la chûte de la Pyrite (rive ouest dans la baie)	19	481500	6370100
82	00QU03KC9403	Rivière aux Mélèzes, a 7,6 km de la Koksoak (rive nord)	19	463300	6392000
83	00QU03FA9405	Rivière Nastapoca, à 29 km de son embouchure (en amont des chutres)	18	426300	6302400
84	00QU03JB9409	Rivière aux Feuilles, à 6,4 km en aval de la Péladau (en amont de la pointe)	19	417500	6500700
85	00QU03ED9401	Grande rivièree de la Baleine, à 30,6 km an amont de la Denys	18	347200	6116700
86	00QU03HA9408	Rivière Arnaud, à 13,7 km en amont de la rivière Hamelin	19	337800	6653800
87	00QU03MD9411	Rivière Georges à la sortie du lac de la Hutte sauvage (17 km en amont de la Falcoy et 2 km du rocher à la décharge du lac Terriault)	20	383439	6295369
88	00QU03EC9413	Rivière Denys à 26,9 km de la Grande rivière de la Baleine (en amont du rapide)	18	367290	6097585
89	00QU03FC9414	Petite rivière de la Baleine à 6,8 km en amont du chenal Ancel (lac Mollet, 4,1 km avant la rivière au sommet de la décharge du lac)	18	541495	6170330
90	01QU03FA9415	Lac des Loups Marins (face aux deux îles à la sotie du lac vers la rivière Nastapoca)	18	547420	6256685
91	00QU03FB9416	Rivière du Nord à 10,5 km de l'emboucure (lac Guillaume-Délisle)	18	425365	6265985
92	01QU03JA9417	Lac Minto (à l'ouest des îles Simialuit)	18	513545	6350460
93	00QU03FB9418	Rivière à l'eau claire, à la sortie du lac à l'eau claire (près du bout de l'île en triangle)	18	510145	6229365
94	00QU03ED9419	Rivière Coast à 11,7 km de la Grande rivière de la Baleine	18	370905	6140360

SUBSTANCES TOXIQUES

a) Bassins versants (fédérales-provinciales):

NUMERO		DESCRIPTION	COORDONNEES UTM		
NAQUADAT	BQMA		ZONE	EST	NORD
		Rivière Richelieu, à Noyan			
		Rivière Richelieu, en aval de Saint-Jean sur Richelieu			
		Rivière L'Acadie (bassin de la rivière Richelieu)			
		Rivière du Sud (bassin de la rivière Richelieu)			
		Rivière des Hurons (bassin de la rivière Richelieu)			
		Rivière Richelieu, bassin de Chambly, près de la marina			
		Rivière Richelieu, bassin de Chambly, en aval de la rivière des Hurons			
		Rivière Richelieu, à Beloeil			
		Rivière Richelieu, en amont de Saint-Marc-sur-Richelieu			
		Rivière Richelieu, à Saint-Denis			
		Rivière Richelieu, à Saint-Ours			
		Rivière Richelieu, en amont de Sorel-Tracy			
		Rivière Yamaska, au lac Waterloo			
		Rivière Yamaska, en aval de Farnham			
		Rivière Yamaska, en aval de Saint-Hyacinthe			
		Rivière Yamaska, en aval de Yamaska			
		Lac Saint-François, embouchure du ruisseau Rats musqués			

SUBSTANCES TOXIQUES (suite)

a) Bassins versants (fédérales-provinciales):

NUMERO		DESCRIPTION	COORDONNEES UTM		
NAQUADAT	BQMA		ZONE	EST	NORD
		Lac Aylmer, embouchure du ruisseau Troisième (bassin de la rivière Yamaska)			
		Lac Aylmer, en face de Ward Bay (bassin de la rivière Yamaska)			
		Lac Aylmer, en amont du barrage Saint-Gérard (bassin de la rivière Yamaska)			
		Rivière Saint-François, en aval de East-angus			
		Lac Massawippi, (bassin de la rivière Saint-François)			
		Rivière Massawippi, en amont de Lennoxville (bassin de la rivière Saint-François)			
		Lac Memphrémagog (bassin de la rivière Saint-François)			
		Lac Magog (bassin de la rivière Saint-François)			
		Rivière Magog, en amont du barrage hydro-électrique (bassin de la rivière Saint-François)			
		Rivière Saint-François, en aval du pont-route 216 (bassin de la rivière Saint-François)			
		Rivière Saint-François, en aval de Windsor			
		Rivière Saint-François, en aval de Richmond			
		Rivière Saint-François, en aval de Drummondville			
		Rivière Saint-François à Notre-Dame-de-Pierreville			

. – SUBSTANCES TOXIQUES (suite)

a) Bassins versants (fédérales-provinciales):

NUMERO		DESCRIPTION	COORDONNEES UTM		
NAQUADAT	BQMA		ZONE	EST	NORD
		Rivière Ouareau, en aval de Crabtree (bassin de la rivière L'Assomption)			
		Rivière L'Assomption, en aval de L'Assomption			
		Rivière L'Assomption, à Repentigny			
		Rivière Nicolet, à Victoriaville			
		Rivière Nicolet, en amont de Nicolet			

SUBSTANCES TOXIQUES (suite)

b) Bassins versants (provinciales):

NUMERO		DESCRIPTION	COORDONNEES UTM		
NAQUADAT	BQMA		ZONE	EST	NORD
		Rivière Yamaska, au lac Brome			
		Rivière Yamaska, au réservoir Choinière			
		Rivière Yamaska, au lac Boivin			
		Rivière Yamaska, à Saint-Alphonse de Granby, en amont du barrage			
		Rivière Yamaska, au lac Davignon en amont de Cowansville			
		Rivière Yamaska, en aval de Brigham en aval du barrage			
		Rivière Yamaska, à Adamsville en amont du barrage			
		Rivière Yamaska en amont de Farnham			
		Rivière Noire, en aval de Upton (bassin de la rivière Yamaska)			
		Rivière Noire, en amont de Sainte-Pie (bassin de la rivière Yamaska)			
		Rivière L'Assomption, en amont de L'Assomption			
		Rivière Nicolet sud-ouest, à Danville			
		Rivière Nicolet à Notre-Dame-de-Ham			
		Rivière Bulstrode, à Princeville (bassin de la rivière Nicolet)			

B-2 SUBSTANCES TOXIQUES (suite)

c) Fleuve Saint-Laurent (fédérales-provinciales)

Cinq (5) stations seront situées dans le tronçon du lac Saint-Pierre, soit entre Sorel et Trois-Rivières. L'emplacement exact de ces stations reste à déterminer, conjointement par Environnement-Canada et Environnement Québec. Ces stations seront échantillonnées pour les sédiments de fond, les jeunes poissons et la chair de poisson.

d) Fleuve Saint-Laurent (fédérales)

Stations sédiments de fond

Trente-cinq (35) stations seront situées dans le tronçon du lac Saint-Pierre, soit entre Sorel et Trois-Rivières. L'emplacement exact de ces stations reste à déterminer.

La localisation des stations dans les eaux ouvertes ("open waters") du lac Saint-Pierre correspond aux intersections des lignes "UTM" (carte topographique 1:50000). Ces lignes, d'une résolution d'un kilomètre (1 km), sont orientées nord-sud et est-ouest. Les intersections des lignes nord-sud à un intervalle de 4 km et des lignes est-ouest à un intervalle de 2 km seront les endroits de prélèvements.

La localisation des stations dans le delta de Sorel sera plus déterministe, dictée en fonction des apports de l'amont et de la complexité hydrodynamique du delta. On prévoit des stations juste en amont des barrages de pierre submergés entre les îles suivantes: de Grâce et Ronde, Ronde et Madame, des Barques et du Moine, Mitan et aux Cochons, aux Cochons et Saint-Ignace, pour un total de 5 stations. Il y aura aussi 2 stations un peu en aval de Sorel et 3 autour de l'embouchure des rivières Yamaska et Saint-François.

Il est bien entendu que certaines conditions sur le terrain, sédimentologiques ou logistiques, pourraient amener un changement dans l'emplacement d'une ou des stations.

Les élutriats seront obtenus des 10 stations du delta et de 10 autres stations (choisies selon la sédimentologie et le potentiel de toxicité établi au préalable.

B-2 SUBSTANCES TOXIQUES (suite)

Stations sédiments en suspension:

Sur des transects rive-rive, 3 stations à l'entrée du lac Saint-Pierre et 3 stations à la sortie.

d) Fleuve Saint-Laurent (fédérales):

Les stations pour les jeunes poissons:

NUMERO	DESCRIPTION
MSP 1	Les Grèves (rive sud)
MSP 2	Lanoraie (rive nord)
MSP 3	en aval de Sorel
MSP 4	entre les îles Ronde et Saint-Ignace
MSP 5	en aval des îles aux Castors et aux Veaux
MSP 6	côté voie maritime de l'ilet Bibeau (au bout du chenal des Barques, île des Moines)
MSP 7	en aval des rivières Yamaska et Saint-François
MSP 8	en aval de la rivière du Loup
MSP 9	rive sud de Trois-Rivières
MSP 10	rive nord de Trois-Rivières

PRECIPITATIONS ACIDES

a) Inventaire biologique (provinciales):

Quarante (40) stations seront localisées dans des lacs de la région hydrographique de l'Outaouais. L'emplacement exact de ces stations reste à déterminer.

Réseau du transport à distance des polluants atmosphérique -
Localisation des stations échantillonnées en 1986-87

NO. NAQUADAT	DESCRIPTION
01QU02LH0185	Lac Bohème (S)
01QU02LH0186	Lac Clair (S)
01QU02LH0187	Lac Duck (S)
01QU02LF004	Las Sheridan
01QU02LF0002	Lac David (T)
01QU02LF0003	Lac Graham (S)
01QU02LD0004	Lac des Papillons (S)
01QU02LD0010	Lac Kidney
01QU02LD0005	Lac Blais
01QU02LD0008	Lac Griffin (S)
01QU02LD0011	SN 19222
01QU02LD0009	Lac Chevreuil (T)
01QU02LC0016	Lac General White
01QU02NF0001	Lac Adanys (S)
01QU020B0002	Lac Laurent (S)
01QU02LC0015	Lac Truite Rouge
01QU02NF0002	Lac S.N. 36724 (S)
01QU02NF0005	Lac Nolette
01QU020C0002	Lac Joncs (S)
01QU02NE0001	Lac Fauvette (S)
01QU02NE0003	Lac Thibert (S)
01QU02NE0002	Lac S.N. 92844 (S)
01QU02NF0003	Lac Eclair (T)

Réseau du transport à distance des polluants atmosphérique - Localisation des stations échantillonnées en 1986-87 (suite)

NO. NAQUADAT	DESCRIPTION
01QU02NE0003	Lac Chômeur (T)
01QU02PB0002	Lac Najoua (S)
01QU02PA0002	Lac Congré (S)
01QU02PB0003	Lac Lagou (T)
01QU02RG0001	Lac Daniel (S)
01QU02RG0002	Lac Lemaine (T)
01QU02PB0005	Lac Josselin
01QU02PB0004	Lac Veilleux (S)
01QU02PC0001	Lac Bonneville (T)
01QU02PD0002	Lac McLeod (S)
01QU02PF0001	Lac S.N. 35759 (S)
01QU02RH0001	Lac Thomas (T)

Quatorze (14) stations, dont six (6) temporelles et huit (8) spatiales seront échantillonnées dans la région hydrographique de l'OUTAOUAIS, dans le prolongement du réseau TDPA actuel. La fréquence d'échantillonnage des stations temporelles sera de 6 par année. La localisation de ces stations reste à déterminer et leur échantillonnage complet en 1986/87 est conditionnel à l'obtention des fonds supplémentaires demandés.

1: S: station spatiale
T: station temporelle

c) Lac Laflamme (fédérales):

Deux (2) stations sont situées dans le lac Laflamme, soit une au centre du lac et une à l'exutoire.

ANNEXE

PARAMETRES MESURES EN 1986/87

Qualité des eaux

a) Suivi d'intervention (provincial): paramètres à déterminer

b) Réseau lacs (fédéral-provincial):

- tests physiques: pH, conductivité, couleur vraie.
- ions majeurs: calcium, magnésium, potassium, sodium, chlorures, sulfates, alcalinité totale.
- éléments nutritifs: nitrites-nitrates, ammoniaque, carbone organique et inorganique dissous.
- métaux: aluminium (filtré) et fer.
- autres: acides forts.

c) Réseau-rivières (fédéral-provincial):

- Tests physiques: Température, conductivité, turbidité, couleur vraie, pH.
- ions majeurs: fluorures, alcalinité totale, alcalinité carbonatée, sodium, magnésium, sulfates, chlorures, potassium, calcium.
- élément nutritifs: carbone organique et inorganique dissous, azote total, nitrites-nitrates, azote ammoniacal, phosphore dissous total et phosphore particulaire.
- métaux: manganèse, fer, cuivre, zinc, arsenic, plomb, cadmium, nickel et chrome.
- autres: tanins et lignines.

Qualité des eaux (suite)

d) Réseau Fleuve Saint-Laurent (fédéral):

- Tests physiques:	pH, conductivité, couleur apparente, dureté ~~totale~~ théorique, matière solide en suspension totale, turbidité, température, oxygène dissous.
- ions majeurs:	calcium, magnésium, sodium, potassium, chlorures, sulfates et alcalinité totale.
- éléments nutritifs:	phosphore total, nitrites-nitrates; carbone organique total, pour les stations de l'émissaire et du lac Saint-Pierre; ammoniaque pour les stations du lac Saint-Pierre.
- métaux:	aluminium, cuivre, cadmium, fer, nickel, manganèse, plomb, zinc, arsenic et sélénium; chrome, cobalt et mercure pour les stations du lac Saint-Pierre.
- BPC/OC*:	au stations de Cornwall, Valleyfield et du lac Saint-Pierre.

e) Réseau transfrontalier (fédéral):

- Tests physiques:	pH, conductivité, turbidité, couleur apparente, matière solide en suspension totale et fixe, dureté totale théorique, température.
- ions majeurs:	calcium, magnésium, sodium, potassium, chlorures, sulfates et alcalinité totale.
- éléments nutritifs:	phosphore total, nitrite-nitrate, carbone organique total
- métaux:	aluminium, cadmium, cuivre, fer, nickel, manganèse, plomb, zinc, arsenic et sélénium.

f) Réseau Nouveau-Québec (fédéral et provincial):

- Tests physiques:	pH, conductivité, turbidité, couleur apparente, matière solide en suspension totale et fixe, dureté ~~tota~~le théorique, température.

Qualité des eaux (suite):

f) Réseau Nouveau-Québec (fédéral et provincial):

- ions majeurs:	calcium, magnésium, sodium, potassium, chlorures, sulfates et alcalinité totale.
- éléments nutritifs:	phosphore total, nitrites-nitrates, carbone organique total.
- métaux:	aluminium, cadmium, cuivre, fer, nickel, manganèse, plomb, zinc, arsenic et sélénium.
- BPC/OC*:	A toutes les stations

* Le groupe BPC/OC est composé des paramètres suivants: arochlor total (BPC), HCB, p,p-DDT, o,p-DDT, p,p-DDD, p,p-DDE, p,p-métoxichlore, heptachlore, heptachlore-époxide, alpha endosulfan, gamma-endosulfan, alph-chlordane, gamma-chlordane, lindane, alpha-BHC, mirex, aldrine, endrine, dieldrine.

C-2 Substances toxiques

a) Bassins versants (provincial et fédéral provincial):

N.B. Les tests suivant sont effectués à partir d'échantillons de poissons et/ou de sédiments.

- métaux:	arsenic, béryllium, cadmium, chrome, cuivre, fer, mercure, nickel, plomb, sélénium, vanadium, zinc.
- non métaux:	fluor
- hydrocarbures polyaromatiques (HAP):	acénaphtène, acénaphtylène, anthracène, benzo (a) anthracène, benzo (b) fluoranthène, benzo (k) fluoranthène, benzo (a) pyrène, benzo (g,h,i) térylène, chrysène, dibenzo (a,h) anthracène, fluoranthène, fluorène, indéno (1,2,3-c,d) pyrène, naphtalène, phénanthrène, pyrène.
- Pesticides organochlorés:	aldrine, dieldrine, DDD, DDE, DDT, endrine, époxyde d'heptachlore, heptachlore, hexachlorobenzène, lindane, métoxychlore, mirex.
- Biphényles polychlorés (BPC).	
- Chlorophénols:	trichlorophénol, tétrachlorophénol, pentachlorophénol, hexachlorophénol.

- Substances toxiques (suite)

a) Bassins versants (provincial et fédéral provincial):

- Chlorobenzènes: monochlorobenzène, dichlorobenzène, trichlorobenzène, tétrachlorobenzène, pentachlorobenzène, hexachlorobenzène.
- Haloformes: chloroforme, tétrachlorure de carbone
- Gras
- Granulométrie
- Pourcentage d'humidité

b) Fleuve Saint-Laurent (fédéral et fédéral-provincial):

		sédiments	élutriats	jeunes poissons
métalloides:	Arsenic	X	X	X
	Sélénium	X	X	X
métaux:	Mercure	X	X	X
	Cadmium	X	X	X
	Cobalt	X	X	-
	Chrome	X	X	X
	Cuivre	X	X	X
	Molybdène	X	-	-
	Nickel	X	X	X
	Plomb	X	X	X
	Vanadium	X	-	-
	Zinc	X	X	X
	Fer	X	X	-
	Manganèse	X	X	-
organique:	BPC/OC*	X	X	X
	HAP**	X	X	X

* BPC - Arochlores 1242, 1254, 1260

OC - HCB, aldrine, heptachlore, mirex, alpha , bêta et gamma-BHC, cis et trans-chlordane, p,p'-DDE, o,p'-DDD, o,p'-DDT, p,p'DDD, p,p'-DDT, méthoxychlore, heptachlore époxide, alpha et bêta-endosulfan, dieldine, endrine;

** HAP - fluoranthène, benzo-b-fluoranthène, benzo-k-fluoranthène, benzo-a-pyrène, indénopyrène, benzopyrène.

- Substances toxiques (suite):

b) Fleuve Saint-Laurent (fédéral et fédéral-provincial):

paramètres de support:

Sédiments:	granulométrie (gravier, sable, limon, argile) Carbone organique Carbone inorganique Azote total Phosphore total teneur en eau matière volatile à 550° C
Elutriats:	pH, conductivité, matières solides en suspension, couleur, alcalinité, dureté; nitrites-nitrates, ammoniaque, phosphore total, carbone organique; calcium, magnésium, sodium, potassium, sulfate, chlorures.
Jeunes poissons:	lipides; longueurs moyennes

C-3 Précipitations acides:

a) Inventaire biologique (provincial):

à déterminer

b) Réseau TDPA (fédéral):

- Tests physiques:	pH, conductivité, couleur vraie, température, oxygène dissous.
- ions majeurs:	calcium, magnésium, sodium, potassium, chlorures, sulfates, silicates, alcalinité Gran, alcalinité totale.
- éléments nutritifs:	nitrites-nitrates, ammoniaque, carbone organique et inorganique dissous.
- métaux:	aluminium, fer, manganèse (forme dissoute).

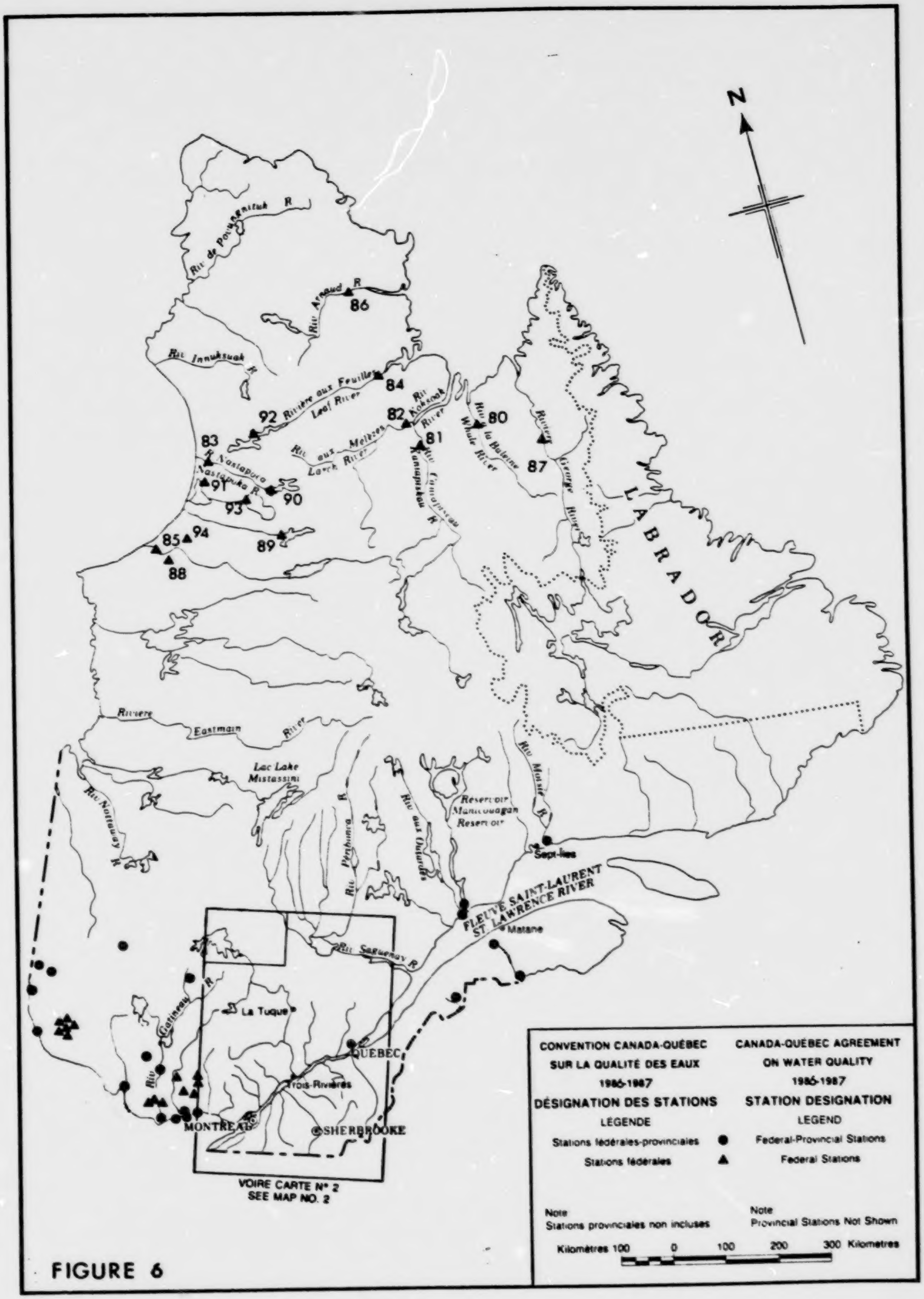
c) Lac Laflamme (fédéral):

- Tests physico-chimiques	température, pH, conductivité, oxygène dissous, couleur apparente, dureté totale, dureté totale calculée.

Précipitations acides (suite):

c) Lac Laflamme (fédéral):

- ions majeurs:	calcium, magnésium, sodium, potassium, chlorures, sulfates, alcalinité Gran, alcalinité totale.
- éléments nutritifs:	phosphore total, nitrites-nitrates, silicates.
- métaux:	aluminium, cadmium, cuivre, fer, nickel, plomb, manganèse, zinc.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Riv de Povungnituk R
Riv Arnaud R
86
Riv Innuksuak R
Rivière aux Feuilles
Leaf River
84
92
Riv Koksoak
82
River
Riv aux Mélèzes
Larch River
81
Riv Caniapiscau
Kaniapiskau R
Riv à la Baleine
Whale River
80
87
Riv George
George River
LABRADOR
83
R Nastapoca
Nastapoka R
91
90
93
85
94
89
88
Rivière Eastmain River
Lac Lake Mistassini
Riv Nottaway R
Riv Péribonca R
Riv aux Outardes
Réservoir Manicouagan Reservoir
Riv Moisie R
Sept-Îles
FLEUVE SAINT-LAURENT
ST. LAWRENCE RIVER
Matane
Riv Saguenay R
Riv Gatineau R
La Tuque
QUÉBEC
Trois-Rivières
MONTRÉAL
SHERBROOKE
VOIRE CARTE N° 2
SEE MAP NO. 2
CONVENTION CANADA-QUÉBEC SUR LA QUALITÉ DES EAUX 1986-1987
CANADA-QUÉBEC AGREEMENT ON WATER QUALITY 1986-1987
DÉSIGNATION DES STATIONS
STATION DESIGNATION
LÉGENDE
LEGEND
Stations fédérales-provinciales ● Federal-Provincial Stations
Stations fédérales ▲ Federal Stations
Note
Stations provinciales non incluses
Note
Provincial Stations Not Shown
Kilomètres 100 0 100 200 300 Kilometres

FIGURE 6

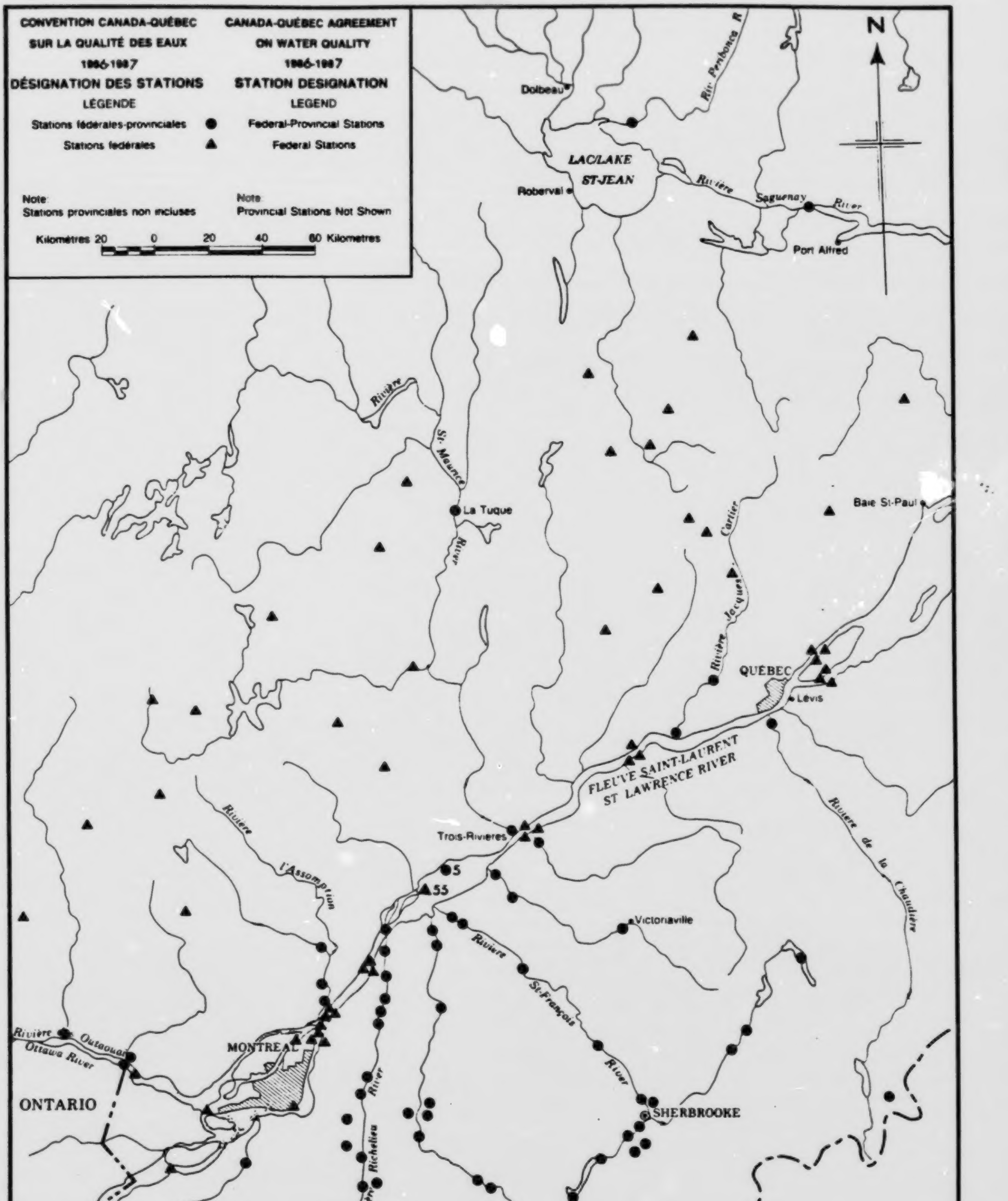

CONVENTION CANADA-QUÉBEC SUR LA QUALITÉ DES EAUX 1986-1987
DÉSIGNATION DES STATIONS
LÉGENDE
Stations fédérales-provinciales ●
Stations fédérales ▲
Note: Stations provinciales non incluses
CANADA-QUÉBEC AGREEMENT ON WATER QUALITY 1986-1987
STATION DESIGNATION
LEGEND
● Federal-Provincial Stations
▲ Federal Stations
Note: Provincial Stations Not Shown
Kilomètres 20 0 20 40 60 Kilometres
N
Dolbeau
Riv. Peribonca R.
LAC/LAKE ST-JEAN
Roberval
Rivière Saguenay River
Port Alfred
Rivière
St. Maurice River
La Tuque
Baie St-Paul
Rivière Jacques-Cartier
QUÉBEC
Lévis
FLEUVE SAINT-LAURENT
ST LAWRENCE RIVER
Rivière l'Assomption
Trois-Rivieres
5
55
Victoriaville
Rivière de la Chaudière
Rivière St-François River
Rivière des Outaouais
Ottawa River
MONTREAL
ONTARIO
Rivière Richelieu River
SHERBROOKE
Riv. Chateauguay
Lac/Lake Champlain
ÉTATS-UNIS
UNITED STATES

FIGURE 7

D.3 ONTARIO REGION

Région de l'Ontario

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ-101

PROJECT TITLE: Lake Superior Open Lake Surveillance

NATIONAL PROGRAM NAME Canada/U.S. and Interjurisdictional Water Management

C&P CODE 1.1

STUDY TEAM: M. Neilson (L), R. Stevens

GOALS:
1. Spring cruise (May, 1986) on Lake Superior for a variety of parameters sampling 75 stns, including organics.
2. Participation on Lake Superior Task Force. (Neilson).
3. Preparation of 2 reports - (a) results of 1985 trace metal survey, (b) results of 1986 organics survey (Stevens, Neilson).

RATIONALE:
To fulfill Canada's commitment for surveillance and monitoring under the Canada-U.S. Great Lakes Water Quality Agreement and for provision of data and assistance to the International Joint Commission.

DESCRIPTION:
- Whole water samples will be collected at 19 stations on Lake Superior using the counter-current extractor developed by P. Goulden to verify 1983 results.
- On the recommendation of the Lake Superior Task Force, spring sampling for trend assessment will again be carried out during 1986/87.
- Further development of the Lake Superior Surveillance Plan anticipated.
- Trace metal results will be written up (for all 3 Great Lakes) by March /86.
- Results of organics sampling conducted in 1986 on Lakes Huron, Superior and Ontario will be written up by March 1987 (dependent on turnaround time in laboratory.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS TURNAROUND TIME 60d

	Laboratory	Great Lakes Division	Total
PY TECH.	0.5	-	0.51
PROF.	-	0.5	0.50
TOTAL PY	0.5	0.5	1.01
SALARIES	17.87K	17.21K	35.08K
O&M	-	5.0K	5.0
CONTRACTS	-	0.0	-
CAPITAL	-	0.0	-
TOTAL $	17.87	22.21	40.08

Note: 1PY-WQB=43.025K
1PY-WQNL=34.746K

SAMPLING STATION POSITIONS LAKE SUPERIOR 1986

STATION NUMBER	LATITUDE N.	LONGITUDE N.
1	46° 29' 06"	84° 50' 00"
2	46° 32' 36"	84° 44' 54"
3	46° 36' 00"	84° 35' 30"
6	46° 44' 36"	84° 55' 00"
8	46° 53' 36"	84° 40' 03"
11	47° 18' 36"	84° 39' 30"
12	47° 02' 12"	85° 06' 12"
17	46° 42' 48"	85° 49' 06"
22	46° 58' 06"	85° 43' 40"
23	47° 12' 48"	85° 38' 00"
25	47° 27' 18"	85° 16' 30"
28	47° 35' 06"	85° 03' 54"
30	47° 43' 12"	85° 08' 20"
31	47° 55' 06"	84° 54' 46"
34	47° 50' 00"	85° 12' 30"
35	47° 55' 54"	85° 16' 12"
39	47° 41' 24"	85° 58' 00"
43	47° 04' 48"	86° 28' 40"
50	46° 30' 30"	86° 34' 06"
51	46° 31' 00"	87° 20' 12"
52	46° 34' 00"	87° 19' 56"
62	47° 10' 00"	87° 38' 36"
68	47° 01' 00"	88° 11' 00"
69	46° 51' 42"	88° 25' 48"
70	47° 03' 00"	88° 18' 00"
80	47° 35' 00"	86° 57' 02"
84	48° 06' 48"	86° 18' 00"
89	48° 42' 00"	86° 25' 06"
92	48° 35' 00"	86° 33' 54"
95	48° 13' 06"	87° 01' 00"
100	48° 45' 24"	86° 58' 33"
101	48° 44' 06"	87° 10' 00"
102	48° 36' 54"	87° 26' 09"
105	48° 44' 00"	87° 33' 48"
106	48° 34' 30"	88° 07' 00"
113	48° 08' 42"	87° 42' 12"
121	47° 29' 00"	87° 50' 00"
125	47° 36' 18"	88° 13' 00"
130	48° 06' 30"	88° 27' 30"
133	48° 17' 00"	88° 35' 50"

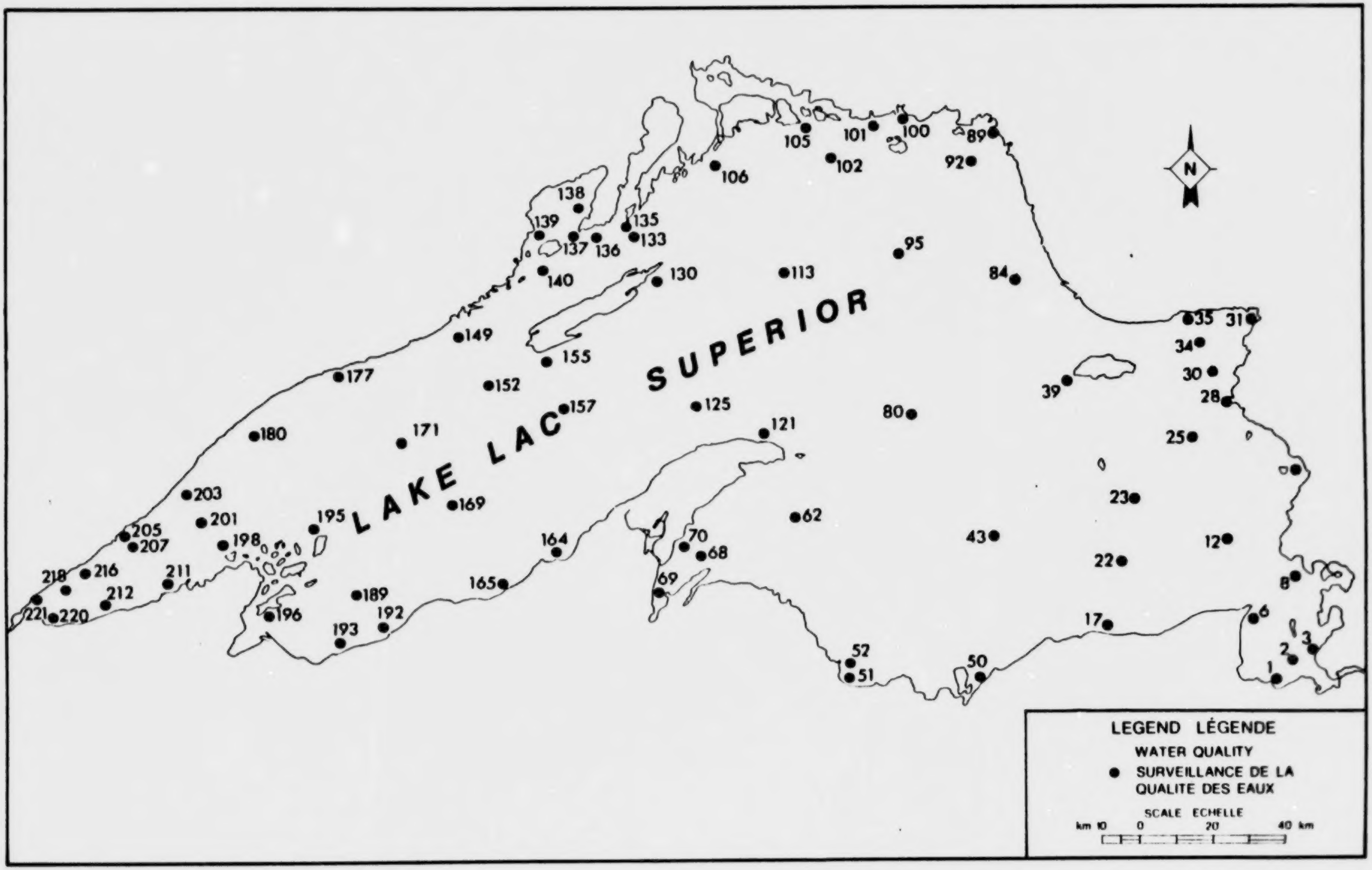
SAMPLING STATION POSITIONS LAKE SUPERIOR 1986

STATION NUMBER	LATITUDE N.	LONGITUDE N.
135	48° 19' 48"	88° 38' 00"
136	48° 17' 24"	88° 49' 48"
137	48° 18' 06"	88° 57' 00"
138	48° 25' 00"	88° 56' 00"
139	48° 17' 54"	89° 10' 48"
140	48° 09' 00"	89° 08' 54"
149	47° 53' 00"	89° 38' 24"
152	47° 41' 18"	89° 28' 00"
155	47° 48' 12"	89° 08' 48"
157	47° 36' 48"	89° 00' 00"
164	47° 01' 36"	89° 02' 18"
165	46° 53' 30"	89° 20' 51"
169	47° 12' 24"	89° 40' 00"
171	47° 27' 00"	89° 55' 15"
177	47° 43' 00"	90° 20' 00"
180	47° 28' 00"	90° 51' 18"
185	47° 06' 00"	90° 27' 45"
189	46° 50' 42"	90° 11' 20"
192	46° 42' 00"	90° 01' 54"
193	46° 38' 00"	90° 18' 00"
196	46° 44' 54"	90° 42' 12"
198	47° 00' 36"	90° 59' 00"
201	47° 07' 54"	91° 06' 42"
203	47° 13' 18"	91° 12' 18"
205	47° 03' 12"	91° 34' 00"
207	47° 00' 12"	91° 30' 54"
211	46° 50' 12"	91° 20' 42"
212	46° 45' 00"	91° 40' 30"
216	46° 54' 24"	91° 49' 12"
218	46° 49' 00"	91° 53' 06"
220	46° 42' 18"	91° 57' 54"
221	46° 46' 54"	92° 03' 15"

PARAMETER LIST
LAKE SUPERIOR

temp.
specific conductance
pH
dissolved oxygen
filtered chloride
filtered sulphate
filtered calcium
alkalinity
phosphorus - total, unfiltered
  - total, filtered
  - soluable reactive
nitrogen - filtered ammonia
  - filtered nitrate-plus-nitrite
  - total particulate
carbon - dissolved organic
  - particulate organic
soluble reactive silica
chlorophyll a - corrected
  - uncorrected
alkyl lead
benzo-a-pyrene
indenopyrene
benzopyrene
benzo-k-fluoranthene
benzo-b-fluoranthene
fluoranthene

Hexachlorobenzene
Alpha-BHC
Lindance
Heptachlor
Aldrin
Heptachlor Epoxide
Gamma(trans)-chlordane
Alpha(cis)-chlordane
Alpha-endosulfan
p,p'-DDE
Dieldrin
Endrin
o,p'-DDT
p,p'-TDP
p,p'-DDT
Beta-endosulfan
Mirex
Methoxychlor
Total PCB
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4,5-Tetrachlorobenze
1,2,3,5-Tetrachlorobenze
1,2,3,4-Tetrachlorobenze
Pentrachlorobenzene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LAKE LAC SUPERIOR
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LEGEND LÉGENDE
WATER QUALITY
SURVEILLANCE DE LA QUALITE DES EAUX
SCALE ECHELLE
km 10 0 20 40 km

FIGURE 11 WATER QUALITY BRANCH MONITORING STATIONS **1986 – 87**
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ
DES EAUX **1986 – 87**

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ-102

PROJECT TITLE: Lake Huron Open Lake Surveillance

NATIONAL PROGRAM NAME Canada/U.S. and Interjurisdictional Water Management C&P CODE 1.1

STUDY TEAM: M. Neilson (L), R. Stevens, S. Metikosh

GOALS:

1. Update status of water quality of Lake Huron for submission to Task Force. (S. Metikosh)*.
2. Participation on Lake Huron Task Force as req'd (Metikosh, Neilson).
3. Conduct one spring (May/86) and one summer (August/86) cruise on Lake Huron sampling 90 stations for a variety of parameters including trace organics.
4. Rezone Lake Huron using previously-established statistical procedures with modifications (Neilson).
5. Preparation of trace metal and organics papers (see. WQ-101).

RATIONALE: Great Lakes W.Q. Agreement, IJC

DESCRIPTION:

- An update of the status of the water quality of Lake Huron since the 1980 Lake Huron intensive year (covering 1981-1985) will be compiled for submission to the Lake Huron Task Force* by March 31, 1987. This project is in anticipation of a formalized request by the LHTF (date unknown). It is however, necessary to summarize this data for our own purposes. Will also serve to familiarize the future Chairman of the Task Force with Lake Huron.
- The annual component of the Lake Huron Surveillance Program will include monitoring approx. 90 stations for an extensive series of parameters including trace organics in whole water samples (25 stations)
- To optimize sampling strategy, will rezone Lake Huron by Nov. 86 - future attempts will be made to det. minimum # stations required.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS TURNAROUND TIME 60d

	Laboratory	Great Lakes Division	Total
PY TECH.	1.1	-	1.1
PROF.	-	0.5	0.5
TOTAL PY	1.1	0.5	1.6
SALARIES	37.49	21.51	59.0
O&M	-	5.0	5.0
CONTRACTS	-	0.0	-
CAPITAL	-	0.0	-
TOTAL $	37.49	26.51	64.0

Sampling Stations
Lake Huron
1985-86

Station Number	Latitude N.	Longitude N.
1	43° 05' 24"	82° 23' 30"
3	43° 15' 25"	82° 02' 18"
4	43° 19' 30"	81° 47' 18"
5	43° 32' 54"	81° 44' 42"
7	43° 20' 30"	82° 30' 24"
8	43° 34' 00"	82° 29' 06"
9	43° 38' 00"	82° 13' 00"
10	43° 45' 12"	81° 46' 54"
11	43° 57' 24"	81° 47' 12"
12	43° 53' 24"	82° 03' 24"
13	43° 45' 12"	82° 34' 06"
14	43° 56' 30"	82° 40' 00"
17	44° 06' 00"	82° 52' 00"
20	44° 13' 00"	83° 05' 00"
23	44° 20' 00"	83° 18' 00"
27	44° 11' 54"	82° 30' 12"
29	44° 22' 00"	81° 50' 00"
30	44° 28' 00"	81° 27' 12"
32	44° 27' 12"	82° 20' 30"
33	44° 30' 00"	82° 50' 00"
34	44° 38' 24"	83° 13' 54"
36	45° 02' 06"	83° 22' 42"
38	010N02IH0014	
39	44° 39' 24"	81° 22' 42"
40	44° 53' 54"	81° 26' 12"
41	45° 05' 00"	81° 32' 18"
42	45° 13' 18"	81° 49' 12"
43	45° 00' 48"	82° 00' 30"
44	45° 01' 00"	82° 41' 06"
47	45° 15' 18"	83° 20' 48"
48	45° 16' 42"	82° 27' 06"
50	45° 32' 06"	82° 02' 42"
52	45° 39' 06"	82° 38' 54"
54	45° 31' 00"	83° 25' 00"
55	45° 23' 30"	83° 39' 06"

Sampling Stations
Lake Huron
1986
(Continued)

Station Number	Latitude N.	Longitude N.
56	45° 31' 00"	84° 05' 00"
58	45° 52' 06"	83° 16' 00"
59	45° 46' 00"	83° 01' 42"
60	45° 54' 06"	83° 31' 06"
61	45° 45' 00"	83° 55' 00"
62	45° 40' 30"	84° 11' 12"
63	45° 42' 12"	84° 30' 42"
64	45° 48' 48"	84° 45' 18"
65	45° 50' 42"	84° 34' 00"
66	45° 51' 48"	84° 17' 42"
67	45° 56' 06"	83° 54' 00"
68	46° 02' 30"	83° 51' 12"
69	46° 04' 42"	84° 01' 42"
70	46° 08' 12"	83° 40' 18"
71	46° 14' 00"	83° 44' 48"
73	46° 11' 12"	83° 12' 18"
76	46° 00' 00"	83° 26' 00"
77	45° 58' 12"	83° 11' 54"
79	46° 07' 24"	82° 53' 09"
82	45° 56' 18"	82° 45' 30"
83	46° 00' 00"	82° 33' 00"
84	46° 05' 30"	82° 33' 24"
87	46° 03' 40"	82° 11' 50"
88	46° 03' 20"	82° 00' 00"
89	45° 55' 00"	82° 09' 40"
95)	44° 12' 45"	83° 22' 15"
96)	44° 07' 35"	83° 10' 15"
97)	44° 06' 55"	83° 31' 45"
98)	43° 58' 35"	83° 34' 32"
99) Saginaw Bay	43° 54' 30"	83° 44' 30"
)		
100)	43° 49' 30"	83° 49' 02"
101)	43° 49' 15"	83° 37' 30"

Sampling Stations
Georgian Bay
1985-86

Station Number	Latitude N.	Longitude N.
1	44° 43' 03"	80° 51' 24"
3	44° 43' 30"	80° 37' 00"
4	44° 38' 45"	80° 10' 00"
5	44° 47' 48"	80° 14' 36"
6	44° 44' 12"	80° 26' 06"
8	44° 57' 10"	80° 08' 06"
9	44° 52' 18"	79° 58' 05"
11	44° 55' 15"	80° 36' 21"
12	44° 55' 12"	80° 52' 30"
15	45° 10' 00"	80° 17' 48"
16	45° 21' 13"	80° 29' 12"
17	010N02IG0003	
19	45° 04' 00"	81° 15' 14"
21	45° 21' 54"	81° 11' 24"
24	45° 40' 44"	80° 50' 20"
26	45° 50' 00"	80° 54' 00"
27	45° 52' 00"	81° 00' 00"
29	45° 35' 00"	81° 05' 00"
31	45° 14' 18"	81° 26' 24"
33	45° 22' 13"	81° 35' 06"
35	45° 31' 39"	81° 40' 10"
36	45° 42' 30"	81° 37' 12"
39	45° 52' 24"	81° 15' 30"
42	45° 54' 46"	81° 35' 42"

PARAMETER LIST
LAKE HURON AND GEORGIAN BAY

temp.
specific conductance
pH
dissolved oxygen
filtered chloride
filtered sulphate
filtered calcium
alkalinity
phosphorus - total, unfiltered
 - total, filtered
 - soluable reactive
nitrogen - filtered ammonia
 - filtered nitrate-plus-nitrite
 - total particulate
carbon - dissolved organic
 - particulate organic
soluble reactive silica
chlorophyll a - corrected
 - uncorrected
alkyl lead
benzo-a-pyrene
indenopyrene
benzopyrene
benzo-k-fluoranthene
benzo-b-fluoranthene
fluoranthene

Hexachlorobenzene
Alpha-BHC
Lindance
Heptachlor
Aldrin
Heptachlor Epoxide
Gamma(trans)-chlordane
Alpha(cis)-chlordane
Alpha-endosulfan
p,p'-DDE
Dieldrin
Endrin
o,p'-DDT
p,p'-TDP
p,p'-DDT
Beta-endosulfan
Mirex
Methoxychlor
Total PCB
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4,5-Tetrachlorobenze
1,2,3,5-Tetrachlorobenze
1,2,3,4-Tetrachlorobenze
Pentrachlorobenzene

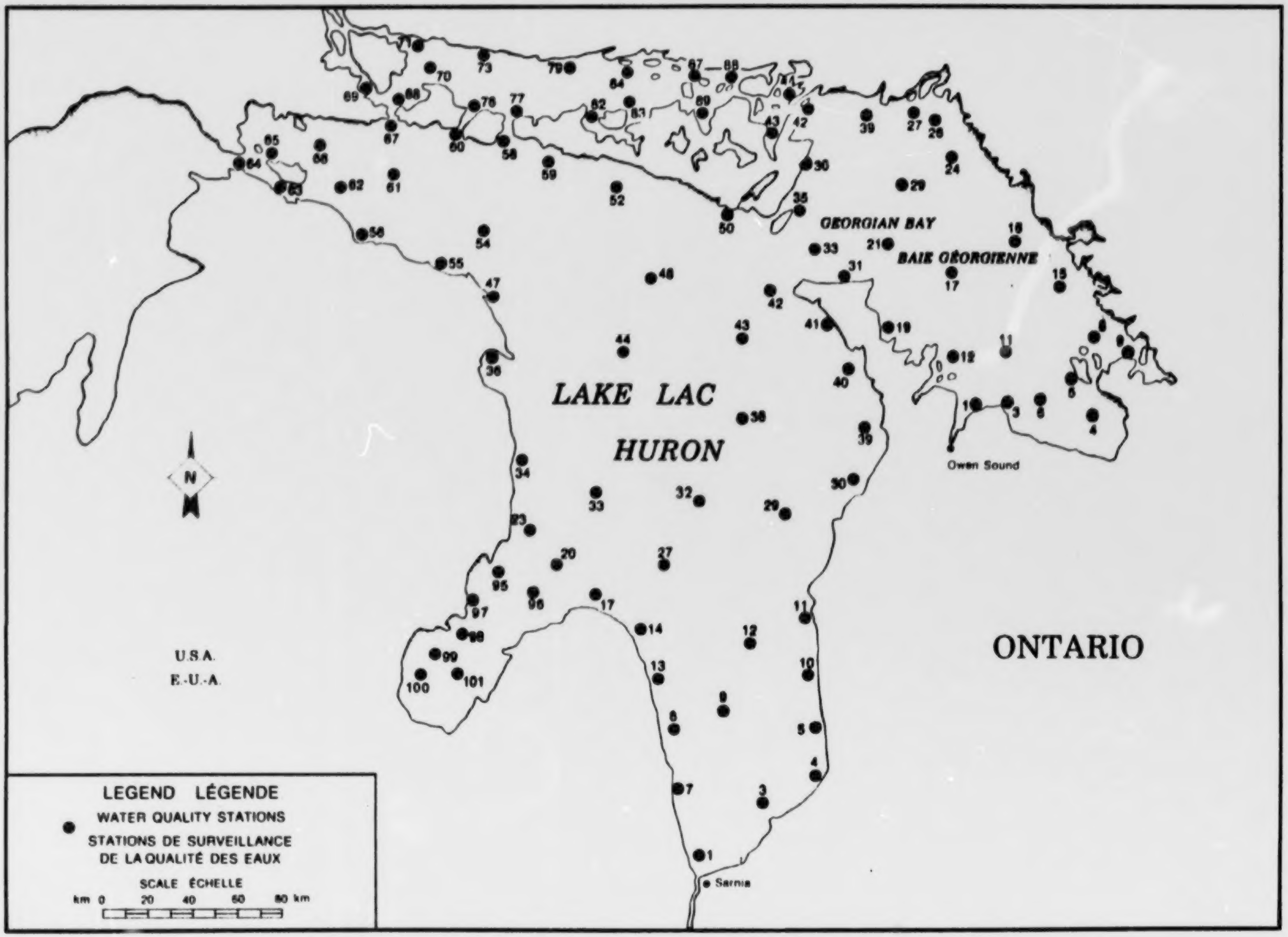

LAKE LAC
HURON
GEORGIAN BAY
BAIE GEORGIENNE
ONTARIO
Owen Sound
Sarnia
U.S.A.
E.-U.-A.
N
LEGEND LÉGENDE
● WATER QUALITY STATIONS
STATIONS DE SURVEILLANCE
DE LA QUALITÉ DES EAUX
SCALE ÉCHELLE
km 0 20 40 60 80 km

FIGURE 12 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ
DES EAUX 1986-87

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ- 104

PROJECT TITLE: Lower Lakes Surveillance

NATIONAL PROGRAM Canada/U.S. and Interjurisdictional Water Management C&P CODE 1.1

STUDY TEAM: R. Stevens, M. Neilson

GOALS:

1. Preparation of paper on trace metals in surface waters of Lake Ontario by March, 1987.
2. Preparation of paper on organic contaminants in lakes Ontario and Erie by March 1987 (subject to analytical turnaround time)
3. Rerun ALDAR programs for 1968 to 1985 using new zonation scheme and transfer to microfiche*
4. Statistically determine required number of stations on Lake Ontario*
5. Complete five full chemistry cruises (April 2, mid-July, mid-August, mid September)
6. Participate on the Lake Ontario and Lake Erie Task Forces as required.
7. Revisions to Lake Ontario Intensive report.

RATIONALE: Great Lakes W.Q. Agreement, IJC

DESCRIPTION:

The annual component of the Lake Ontario Surveillance Program will include two full chemistry spring cruises and 3 partial chemistry summer cruises (mid-July, mid-August, mid-September) emphasizing biomass estimates. Spring cruises will require the support of 2 lab technicians from WQNL.
Organic samples will be collected at approximately 35 stations on Lake Ontario and 21 on Lake Erie using whole water samples extracted with P. Goulden's extractor.
Trace metal and organics papers will encompass data from all lakes i.e. two reports covering all data
* Attainment of these goals contingent upon receiving student support.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS TURNAROUND TIME

	Laboratory	Great Lakes Division	Total
PY TECH.	1.35	-	1.35
PROF.	-	0.95	0.95
TOTAL PY	1.35	0.95	2.3
SALARIES	47.03	40.87	87.9
O&M	-	8.1	8.1
CONTRACTS	-	-	
CAPITAL	57.0*	48.97	96.0
TOTAL $	104.03	48.97	153.0

* RDG Funds

Surveillance Stations
Lake Ontario
1986

Station Number	Latitude N.	Longitude N.
1	43° 18' 48"	79° 45' 06"
2	43° 20' 24"	79° 39' 54"
3	43° 16' 06"	79° 37' 12"
5	43° 25' 30"	79° 39' 30"
6	43° 28' 00"	79° 31' 48"
7	43° 32' 48"	79° 29' 18"
8	43° 37' 24"	79° 27' 12"
9	43° 35' 12"	79° 23' 42"
10	43° 40' 06"	79° 16' 00"
11	43° 35' 06"	79° 18' 42"
12	43° 30' 12"	79° 21' 12"
13	43° 25' 00"	79° 24' 00"
14	43° 23' 36"	79° 29' 12"
15	43° 19' 00"	79° 26' 36"
16	43° 16' 18"	79° 21' 36"
17	43° 13' 30"	79° 16' 18"
18	43° 18' 12"	79° 16' 42"
19	43° 23' 00"	79° 17' 06"
20	43° 20' 18"	79° 11' 48"
21	43° 18' 00"	79° 07' 12"
22	43° 17' 48"	79° 00' 18"
23	43° 22' 12"	79° 04' 00"
24	43° 26' 24"	79° 07' 42"
25	43° 31' 00"	79° 04' 48"
26	43° 36' 30"	79° 01' 00"
27	43° 42' 12"	78° 57' 24"
28	43° 46' 30"	78° 51' 18"
29	43° 49' 48"	78° 52' 12"
30	43° 49' 48"	78° 39' 42"
31	43° 53' 12"	78° 27' 36"
32	43° 47' 00"	78° 26' 18"
33	43° 35' 48"	78° 48' 06"
34	43° 27' 42"	78° 45' 36"
35	43° 21' 36"	78° 43' 48"
36	43° 29' 30"	78° 23' 12"

Surveillance Stations
Lake Ontario
1986
(Continued)

Station Number	Latitude N.	Longitude N.
37	43° 23' 30"	78° 22' 12"
38	43° 23' 00"	77° 59' 24"
39	43° 29' 12"	78° 00' 00"
40	43° 35' 24"	78° 00' 42"
41	010N02I00021	
42	43° 50' 24"	78° 02' 18"
43	43° 57' 00"	78° 03' 00"
44	43° 52' 54"	77° 54' 30"
45	43° 49' 12"	77° 47' 00"
46	43° 53' 06"	77° 41' 24"
47	43° 57' 06"	77° 35' 18"
48	43° 51' 42"	77° 31' 30"
49	43° 46' 18"	77° 26' 18"
52	43° 26' 00"	77° 42' 42"
53	43° 21' 00"	77° 42' 42"
54	43° 24' 48"	77° 34' 30"
55	43° 26' 36"	77° 26' 18"
56	43° 21' 36"	77° 30' 54"
57	43° 16' 30"	77° 35' 30"
58	43° 19' 42"	77° 26' 18"
59	43° 22' 54"	77° 17' 54"
60	43° 34' 48"	77° 12' 00"
61	43° 47' 12"	77° 09' 30"
62	43° 52' 48"	76° 00' 00"
63	43° 43' 54"	77° 01' 00"
64	43° 31' 30"	76° 55' 36"
65	43° 25' 24"	76° 53' 00"
66	43° 20' 00"	76° 50' 24"
67	43° 24' 30"	76° 47' 42"
68	43° 31' 48"	76° 43' 54"
69	43° 36' 24"	76° 42' 48"
70	43° 32' 30"	76° 37' 06"
71	43° 28' 36"	76° 31' 36"
72	43° 33' 00"	76° 31' 30'
73	43° 38' 00"	76° 17' 18"

Surveillance Stations
Lake Ontario
1986
(Continued)

Station Number	Latitude N.	Longitude N.
74	43° 45' 00"	76° 31' 06"
75	43° 50' 36"	76° 21' 18"
76	43° 57' 00"	76° 10' 30"
77	43° 57' 00"	76° 24' 30"
78	44° 57' 24"	76° 24' 24"
79	44° 04' 30"	76° 31' 18"
80	44° 08' 30"	76° 31' 18"
81	44° 01' 00"	76° 40' 18"
82	44° 04' 00"	76° 48' 42"
83	44° 00' 00"	76° 50' 36'
84	43° 53' 12"	76° 44' 00"
85	43° 45' 00"	79° 05' 00"
86	43° 15' 18"	79° 11' 42"
87	43° 17' 54"	77° 31' 06"
88	43° 35' 18"	76° 25' 00"
89	43° 41' 54"	76° 25' 00"
90	44° 08' 11"	76° 49' 30"
91	43° 55' 12"	78° 18' 24"
93	43° 19' 36"	78° 52' 06"
94	43° 19' 30"	77° 13' 00'
95	43° 18' 48"	77° 00' 00"
96	43° 13' 24"	79° 26' 48"
97	43° 57' 42"	76° 07' 18"
98	43° 56' 06"	76° 13' 54
100	44° 08' 12"	76° 19' 48"
101	44° 11' 36"	76° 18' 36"
102	44° 12' 12"	76° 14' 12"

PARAMETER LIST
LAKE ONTARIO

temp.
% transmission
specific conductance
pH
total dissolved solids
dissolved oxygen
filtered chloride
filtered sulphate
filtered calcium
filtered sodium
filtered potassium
filtered magnesium
alkalinity
phosphorus - total, unfiltered
 - total, filtered
 - soluable reactive
nitrogen - filtered ammonia
 - filtered nitrate-plus-nitrite
 - total particulate
 - total kjeldahjl nitrogen
carbon - dissolved organic
 - particulate organic
soluble reactive silica
chlorophyll a - corrected
 - uncorrected
alkyl lead
benzo-a-pyrene
indenopyrene
benzopyrene
benzo-k-fluoranthene
benzo-b-fluoranthene
fluoranthene

Hexachlorobenzene
Alpha-BHC
Lindance
Heptachlor
Aldrin
Heptachlor Epoxide
Gamma(trans)-chlordane
Alpha(cis)-chlordane
Alpha-endosulfan
p,p'-DDE.
Dieldrin
Endrin
o,p'-DDT
p,p'-TDP
p,p'-DDT

Beta-endosulfan
Mirex
Methoxychlor
Total PCB
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4,5-Tetrachlorobenze
1,2,3,5-Tetrachlorobenze
1,2,3,4-Tetrachlorobenze
Pentrachlorobenzene

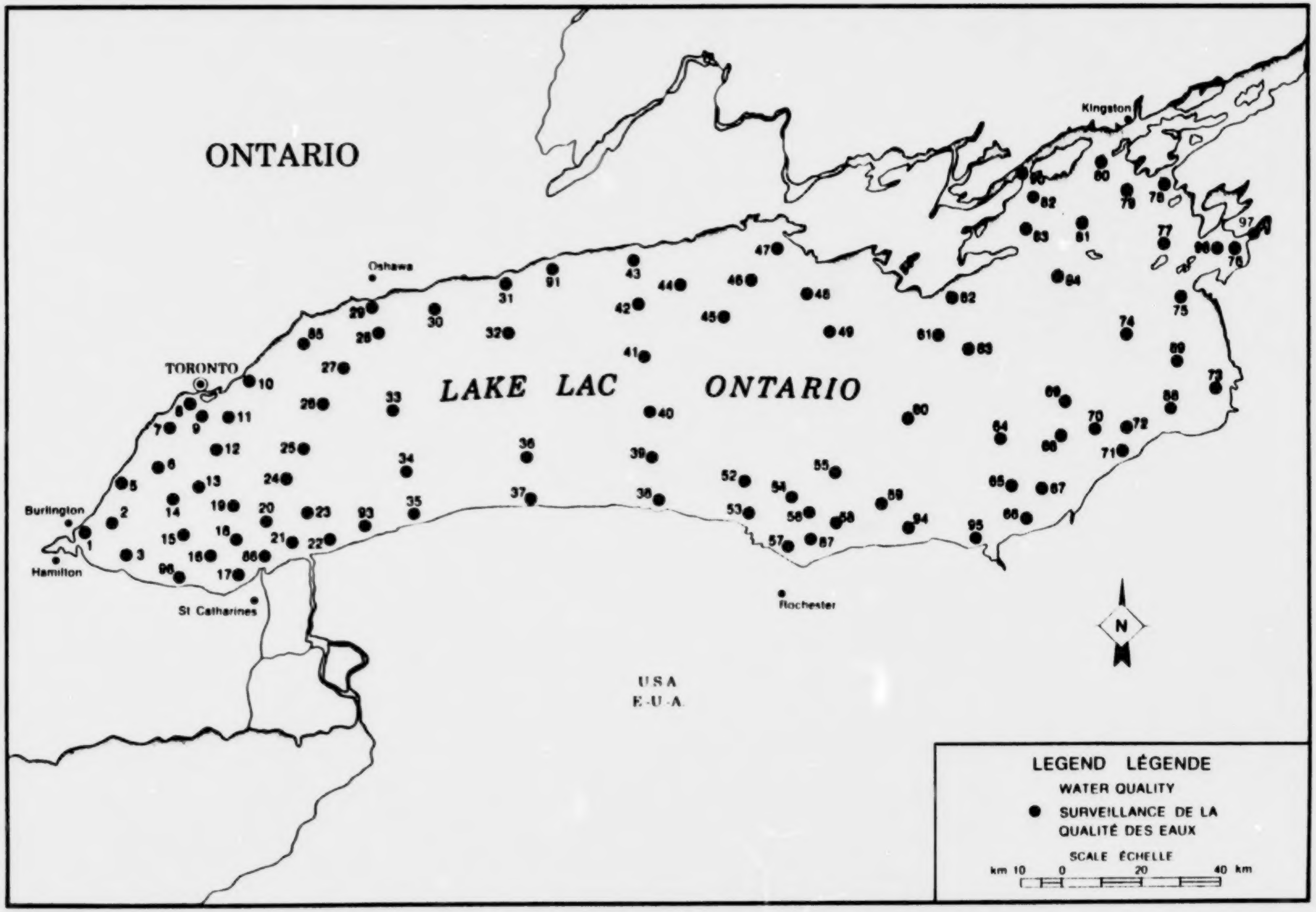

ONTARIO
Kingston
Oshawa
TORONTO
Burlington
Hamilton
St Catharines
Rochester
LAKE LAC ONTARIO
USA
E-U-A
N
LEGEND LÉGENDE
WATER QUALITY
● SURVEILLANCE DE LA QUALITÉ DES EAUX
SCALE ÉCHELLE
km 10 0 20 40 km

FIGURE 13 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

ORGANIC CONTAMINANTS
LAKE ERIE STATIONS

STATION #	LATITUDE N	LONGITUDE W
23	42° 30' 25"	79° 53' 59"
84	41° 56' 09"	81° 39' 16"
211	42° 00' 49"	83° 05' 18"
212	42° 00' 44"	83° 08' 35"
213	41° 58' 08"	83° 12' 30"
214	41° 52' 19"	83° 18' 06"
215	41° 44' 02"	83° 23' 08"
216	41° 50' 49"	82° 32' 44"
218	42° 03' 03"	82° 26' 03"
220	41° 34' 15"	81° 39' 14"
221	42° 15' 11"	81° 06' 24"
222	42° 38' 28"	81° 13' 00"
223	41° 56' 00"	80° 47' 16"
224	42° 10' 47"	80° 01' 54"
225	42° 47' 06"	80° 03' 45"
226	42° 30' 29"	79° 21' 01"
227	42° 50' 42"	79° 34' 37"
228	42° 48' 37"	78° 58' 49"
268	41° 31' 10"	82° 38' 27"
33281	41° 33' 55"	82° 40' 30"
327	41° 49' 39"	82° 58' 06"

PARAMETER LIST
LAKE ERIE

Dissolved Organic Carbon
Hexachlorobenzene
Alpha-BHC
Lindance
Heptachlor
Aldrin
Heptachlor Epoxide
Gamma(trans)-chlordane
Alpha(cis)-chlordane
Alpha-endosulfan
p,p'-DDE
Dieldrin
Endrin
o,p'-DDT
p,p'-TDP
p,p'-DDT
Beta-endosulfan
Mirex
Methoxychlor
Total PCB
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4,5-Tetrachlorobenze
1,2,3,5-Tetrachlorobenze
1,2,3,4-Tetrachlorobenze
Pentrachlorobenzene

PROJECT DESCRIPTION REGION/HQ Ontario
WATER QUALITY BRANCH - 1986/87 PROJECT NO: WQ- 106

PROJECT TITLE: Toxic Chemicals Monitoring of the St. Clair River

NATIONAL PROGRAM NAME Canada/U.S. and Interjurisdictional Water Management C&P 1.1

STUDY TEAM: C.H. Chan

GOALS:
1. To establish and operate two water quality monitoring stations at the inlet and outlet of the St. Clair River for the purpose of identifying and quantifying toxic chemicals in the St. Clair River.

RATIONALE:
This project is proposed to fulfill Canada's committment to carry out monitoring of toxic substances in the St. Clair River under 1978 GLWQA

DESCRIPTION:

This is a continuation of last year's project. The following activities will be implemented in the following stages.

1. Construction and installation of two water quality monitoring stations at Point Edwards and Port Lambton. May 1986.

2. Commence water and suspended sediment sampling on a bi-weekly basis for contaminants analysis.

3. Participate in UGLCC water quality work groups.

4. Analyse and interpret 1985 St. Clair Water Quality survey results by June 1986.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS TURNAROUND TIME 90d

	Laboratory	Great Lakes Division	Total
PY TECH.	0.97	1.0****	1.97
PROF.	-	0.95	.95
TOTAL PY	0.97	1.05	2.92
SALARIES	33.87	65.87	99.74
O&M	100.0*	38***	138.0
CONTRACTS	-	25***	55.0
CAPITAL	30.0*		
TOTAL $	163.87	128.87	292.74

* RDG Funds
** 30.0K RDG Funds
*** 20.0K RDG Funds
**** 1PYRDG=25.0K

SAMPLING STATIONS
ST. CLAIR RIVER

Map No.	NAQUADAT No.	Station Location
41	---	St. Clair River at outlet of Lake Huron (Point Edwards Water Treatment Plant)
42	---	St. Clair River at Port Lambton

PARAMETER LIST

Water

Nutrients	Total Phosphorus	Major Ions	Ca, Mg, SO_4, CL, Na, K
	Nitrate-Nitrite		Total Alkalinity
	Total Kjeldalh Nitrogen		Reactive Silica

Metal Fe, Cu, Pb, Mn, Ni, Zn, Al (ext), Hg (ext)

Physicals: Specific Conductance
Total Non-filterable Residue
pH

WHOLE WATER AND SUSPENDED SEDIMENTS

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epoxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCB's)

chlorobutadiene
octachlorostyrene
perchlorethylene

Polyaromatic Hydrocarbons

Pyrene
Fluorene
Indene
1,2,3,4-Tetrahydronaphthalene
1-Methylnaphthalene
2-Methylnaphthalene
Beta-Chloronaphthalene
Acenaphthalene
Quinoline
Acenaphthene
Phenanthrene
Fluoranthene

Chlorinated Benzenes

1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3,4-Tetrachlorobenzene
Pentachlorobenzene
Hexachlorobenzene*

PROJECT DESCRIPTION REGION/HQ Ontario
WATER QUALITY BRANCH - 1986/87 PROJECT NO: WQ-107

PROJECT TITLE: Niagara River Water Quality Monitoring

NATIONAL PROGRAM NAME Canada/U.S. and Interjurisdictional Water Management C&P CODE 1.1

STUDY TEAM: K.W. Kuntz, H. Biberhofer

GOALS:

1. To continue collection of water quality samples three times per week at Fort Erie and Niagara-on-the-Lake to provide water quality records for long term trend evaluation and to provide annual estimates of material loads from Lake Erie to Lake Ontario.
2. To provide 1985 differential loading estimates for the Niagara River by October 1986.
3. To continue weekly suspended sediment and water analysis for toxic contaminants at both the source and outlets of the Niagara River.
4. In conjunction with Dr. A. El-Shaarawi, a statistical analysis of existing data will be undertaken to improve sampling design and optimize sampling frequency so that information received is of most use.
5. To undertake special sampling in the Niagara River as required by the RDG's office.
6. To collate and classify all data conducted to date by WQB-OR on the Niagara River by means of the IBM-PC and the Cyber computers subject to the availability of term employee or students help.

RATIONALE:

In support of GLISP to fulfill Canada's surveillance and monitoring requirements on the interconnecting Channels as outlined in annexes' 11 and 12 of the 1978 GLWQA.

DESCRIPTION:

In a continuing project on the Niagara River, water samples are collected at Niagara-on-the-Lake (since 1975) and at Fort Erie (established in Oct. 1983) by an automatic sampler and returned weekly to Burlington for analysis. Suspended sediment and water samples will be collected weekly for organic contaminants analysis. Annual loading estimates will be available for Lake Erie input to the Niagara River and the Niagara River load to Lake Ontario. These differential loading estimates for the Niagara River have been one of the main problems for the NRTC in interpreting previous data for the NRTC report.

Considerable time will be spent analyzing data collected in previous years, to recommend sampling design and frequency to optimize information received.

Membership on the Niagara-St. Lawrence Task Force will be maintained. Coordination with MOE, NYDEC and EPA will continue. Membership on the Niagara River Sampling Protocol Group and the duties of Secretary and Member of the Sampling Design and Data Interpretation Group for the Niagara River are additional duties this year.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS
TURNAROUND TIME 1-2 mo.

	Laboratory	Great Lakes Division	Total
PY TECH.	5.0	2.0*	7.0
PROF.	-	0.9	0.9
TOTAL PY	5.0	2.9	7.9
SALARIES	174.2K	106.75	255.95
O&M	60*	49.7***	109.7
CONTRACTS	-		
CAPITAL	-	12.5****	12.5
TOTAL $	234.2	168.95	378.15

* RDG Funds
** 1PY RDG Funds=25.0K Salary
*** 40.0K RDG Funds
**** 10.0K RDG Funds

SAMPLING STATIONS NIAGARA RIVER

Map No.	NAQUADAT No.	Station Location
1	000N02HA0019	Niagara River at Niagara-on-the-Lake
32	000N02HA0045	Niagara River at Fort Erie

PARAMETER LIST NIAGARA RIVER

Water: Nutrients: TKN, NO$_3$, TP
Major (Ca, Mg, K, T Alk, SO$_4$, Cl, Na. SiO$_2$)
Total Metals - Al, Ba, Cd, Co, Cr, Cu, Fe, Mn, Ma, Ni, Pb, Sr, V, Zn, Sb, Ag
Filtered Metals - Al, Ba, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, Sr, V, Zn
Total Metals - As, Se, Hg
Alkyl Lead - Pb

SEDIMENTS: Total Metals (As, Se, Hg)
Extr. Metals ().5 N HCl) (Cd, Cu, Co, Pb, Zn, Ni, Cr)
Part C + N
Alkyl lead (Pb)

OAL - WATER - PCB's, OC!s, CB's, PAH's, volatiles, phthalates, chlorophenols, TCDD's, Furans

SEDIMENTS - PCB's, OC's, CB's, PAH's, phthalates, chlorophenols, TCDD's, Furans

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ-109

PROJECT TITLE: St. Lawrence River Water Quality Monitoring

NATIONAL PROGRAM NAME Canada/U.S. and Interjurisdictional Water Management C&P CODE 1.1

STUDY TEAM: A. Sylvestre, H. Biberhofer

GOALS:
To collect daily samples to provide long term water quality records, to estimate the annual material exit loads from the Great Lakes system and to characterize seasonal variation of the water quality of the St. Lawrence River.

To collect monthly suspended sediments and whole water samples in order to measure the concentrations of organic contaminants leaving Lake Ontario.

RATIONALE:
To fulfill Canada's surveillance and monitoring requirements for the interconnecting Channels in support of GLSIP as outlined in the 1978 Agreement.

DESCRIPTION:
Samples are collected by an automatic sampler at Wolfe Island. Water samples are sent back through a personal service contract to CCIW for chemical analysis:

- bi-weekly: TKN, NO2+NO3, NH3, T.P.
- weekly: Major ions, trace metals and specific conductance
- composite - Radioactivity.

A monthly suspended sediment sampling program began in 1982 and will continue this year. Collection of 40L instead of 2L whole water samples started in January 1986 and will continue on a monthly basis. The samples will be analysed for PCB's, OC's, PAH's, phthalates and T.M's.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS
TURNAROUND TIME 60d

	Laboratory	Great Lakes Division	Total
PY TECH.	0.44	0.10	0.54
PROF.	-	0.50	0.50
TOTAL PY	0.44	0.60	1.04
SALARIES	15.28	25.82	41.10
O&M	-	5.4	5.4
CONTRACTS	-	2.5	2.5
CAPITAL	-		
TOTAL $	15.28	33.72	49.0

SAMPLING STATIONS
ST. LAWRENCE RIVER

Map No.	NAQUADAT No.	Station Location
2	000N02MA0030	St. Lawrence River

PARAMETER LIST

Water

Nutrients
Total Phosphorus
Nitrate-Nitrite
Total Kjeldalh Nitrogen

Major Ions
Ca, Mg, SO_4, CL, Na, K
K
Total Alkalinity
Reactive Silica

Metal Fe, Cu, Pb, Mn, Ni, Zn, Al (ext), Hg (ext)

Physicals:
Specific Conductance
Total Non-filterable Residue
pH

WHOLE WATER AND SUSPENDED SEDIMENTS

Organics

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCBs)

Polyaromatic Hydrocarbons

Pyrene
Fluorene
Indene
1,2,3,4-Tetrahydronaphthalene
1-Methylnaphthalene
2-Methylnaphthalene
Beta-Chloronaphthalene
Acenaphthalene
Quinoline
Acenaphthene
Phenanthrene
Fluoranthene

Chlorinated Benzenes

1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,3,4-Techchlorobenzene
Pentachlorobenzene
Hexachlorobenzene*

Suspend Sediments
CHN

PROJECT DESCRIPTION REGION/HQ
Ontario
WATER QUALITY BRANCH - 1986/87 PROJECT NO: WQ-110

PROJECT TITLE: Precipitation Chemistry Network

NATIONAL PROGRAM NAME Canada/US and Interjurisdictional Waters C&P CODE 1.1

STUDY TEAM: C.H. Chan & L.H. Perkins

GOALS:

To provide long term records of chemical composition and atmospheric deposition in the Great Lakes Basin and to provide estimates of material loadings to the Great Lakes.

RATIONALE:

To fulfill Canada's Surveillance and Monitoring activities on atmospheric inputs as outlined in the 1978 GLWQA.

DESCRIPTION:

This is an on-going program on Great Lakes Atmospheric deposition. The current fifteen station network will continue with monthly wet precipitation samples. An additional station in the Lake Erie Basin (tentative, Port Stanley) will be established to provide better aerial coverage of Lake Erie. Sampling protocol will be reviewed and revised, if necessary, to CAPMON protocol. Participation of IJC work groups and provide technical inputs into Lake Task Forces as required.

RESOURCES ($'000) 1986/87 ACCEPTABLE ANALYSIS TURNAROUND TIME

	Laboratory	Surveys & Interpretation	Total
PY TECH.	0.21	0.6	0.81
PROF.	-	0.2	0.20
TOTAL PY	0.21	0.8	1.01
SALARIES	7.17	34.42	41.59
O&M	-	0.6	.60
CONTRACTS	-	6.0	6.0
CAPITAL	-	6.0K	6.0
TOTAL $	7.17	47.02	54.19

SAMPLING STATIONS
PRECIPITATION CHEMISTRY
NETWORK

Map No.	NAQUADAT NO.	STATION LOCATION
15	330N02AC0700	Squaw Bay, Sibley Provincial Park
24	330N02BA0702	Rossport,North Shore of Lake Superior
27	330N02BD0702	Wawa, mouth of Magpipe River
28	330N02BF0701	Turkey Lake, Batchawana Mountain
17	330N02CG0701	South Baymouth, Tehkummah Research Station
18	330N02FA0700	Wiarton airport
19	330N02FE0700	Goderich Pollution Plant
20	330N02GH0700	Pelee Island airport
21	330N02GC0701	Big Creek, Long Point
22	330N02HA0700	Niagara-on-the-Lake
23	330N02HB0705	Waterdown Road, Burlington
25	330N02HC0701	Woodbridge, meterologivcal Research Station
26	330N02HK0700	Weather Station at Trenton Arm Forces Base
43	330N02MA0700	Banford Point, Wolfe Island
44	-	Port Stanley

PARAMETER LIST

Nutrients	Total Phosphorus Nitrate-Nitrite Total Kjeldahl Nitrogen
Major Ions	Ca, Mg, SO_4, CL, Na, K K Total Alkalinity Reactive Silica
Metal	Fe, Cu, Pb, Mn, Ni, Zn, Al, Ba, Cd, Co, Cr, Mo, V, Sr
Physicals:	Specific Conductance pH

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ- 121

PROJECT TITLE: NORTHERN BASELINE NETWORK

NATIONAL PROGRAM NAME Water Quality Management Data C&P CODE 1.3

STUDY TEAM: R. McCrea and J. Fischer

GOALS:

(1) To monitor the presence of organic contaminants at the outlet of the Moose and Winisk Rivers on a monthly basis.

(2) Prepare a report, based on four years data, describing major ion and heavy metal chemistry in the five major rivers of Ontario's Arctic Watershed (Oct. 86). This report will be submitted for publication in one of the IWD Report Series.

RATIONALE: Ontario's Arctic Watershed comprises over half the land mass of Ontario. The major rivers, which drain this region, represent an important resource to the native population and provide an essential source of nutrients to their estuaries, which are of major national and international importance as nesting and feeding for migratory birds. Sampling sites are located adjacent to Indian Reserves and will provide a long term data base for an Arctic drainage basin with several major industries and one which is virtually free of any point source contamination.

DESCRIPTION: Water quality sampling will be conducted near the mouth of Moose (2 stns) and Winisk Rivers. The three stations will be sampled by lay collectors on a monthly basis for the analyses of organochlorine contaminants (Goal 1). Considerable time and effort will be spent preparing figues, graphs and report writing (Goal 2), and co-authoring a report with G. Leppard, NWRI, on metals and colloids in these northern waters.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS
TURNAROUND TIME ______

	Laboratory	Monitoring & Agreements Division	Total
PY TECH.	0.14	0.1	0.24
PROF.	-	0.1	0.1
TOTAL PY	0.14	0.2 P.Y	0.34
SALARIES	5.0 P.Y	8.6K	8.62
O&M	-	2.5K	2.50
CONTRACTS	-	-	
CAPITAL	-	-	
TOTAL $	5.0	11.1	16.1

SAMPLING STATIONS
NORTHERN BASELINE NETWORK

Map No.	NAQUADAT NO.	STATION LOCATION
13	000N04KA0010	Moose River West Channel upstream from Moosenee
14	000N04KA0011	Moose River East Channel upstream of Moosenee
10	000N04DC0010	Winisk River just upstream of Winisk

PARAMETER LIST

Water

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)
Araclor Total (PCBs)
Hexachlorobenzene

Total PCBs

Polyaromatic Hydrocarbons

1.3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,3,4-Techchlorobenzene
Pentachlorobenzene
Hexachlorobenzene

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ- 124

PROJECT TITLE: LRTAP Support - Parks

NATIONAL PROGRAM NAME Water Quality Management Data C&P CODE: 1.3

DURATION One Year

STUDY TEAM: D. Warry, Vacant TEL: (416)-336-4641

GOALS:

1) To establish contact with Parks Canada regarding water quality monitoring in Ontario's National Parks.

RATIONALE: National Parks are recognized as an area of federal interest in the F.P.S.I.W. Furthermore, Ontario is not as yet providing complete data to the LRTAP Program. Under this projcet, it is proposed to conduct negotiations to determine how best to deal with these federal concerns.

DESCRIPTION: To achieve goal 1 will require:

(a) A review of water quality information already made available to Parks Canada.

(b) Consult with Parks Canada and WQB-HQ regarding the most cost effective means to address the issues of water quality in Ontario's National Parks.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS TURNAROUND TIME 60d

	Laboratory	Monitoring & Agreements Division	Total
PY TECH.			0.10
PROF.			0.25
TOTAL PY			0.35
SALARIES			15.06
O&M			1.5
CONTRACTS			
CAPITAL			
TOTAL $			16.56

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ- 111

PROJECT TITLE: Organic Precipitation Network

NATIONAL PROGRAM NAME TOXIC CHEMICALS C&P CODE 4.1

STUDY TEAM: C.H. Chan & L.H. Perkins

GOALS:

To operate a small network of precipitation stations within the Great Lakes Basin for determining organic contaminant levels in wet precipitation.

RATIONALE:

To fulfill Canada's Surveillance and Monitoring activities on atmospheric deposition of toxic substances as outlined in Canada/US GLWQA.

DESCRIPTION:

1) To continue collecting precipitation samples from Sibley Park, South Bay North, Pelee Island and Wolfe Island on a bi-weekly internal for trace organic analyses. Results from this network will .

2) To participate in IJC Workgroups on atmospheric surveillance work groups.

3) to coordinate Great Lakes atmospheric deposition programs with U.S. EPA.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS TURNAROUND TIME 90days

	Laboratory	Surveys & Interpretation	Total
PY TECH.	0.88	0.1	0.98
PROF.	-	0.1	0.10
TOTAL PY	0.88	0.2	1.08
SALARIES	30.58	8.6	39.18
O&M	-	4.0	4.0
CONTRACTS	-	-	-
CAPITAL	-	-	-
TOTAL $	30.58	12.6	43.18

SAMPLING STATIONS
PRECIPITATION CHEMISTRY
NETWORK

Map No.	NAQUADAT NO.	STATION LOCATION
15	330N02AC0700	Squaw Bay, Sibley Provincial Park
17	330N02CG0701	South Baymouth, Tehkummah Research Station
20	330N02GH0700	Pelee Island airport
43	330N02MA0700	Banford Point, Wolfe Island

PARAMETER LIST

Organochlorine Pesticides

- P,P-DDT
- O,P-DDT
- P,P-TDE
- P,P-DDE
- P,P-Methoxychlor
- Heptachlor
- Heptachlor Epxide
- Alpha-Endosulfan
- Beta-Endosulfan
- Alpha-(cis) Chlordane
- Gamma-(trans) Chlordane
- Alpha-BHC
- Gamma-BHC
- Mirex
- Aldrin
- Endrin
- HEOD (dieldrin)

Araclor Total (PCB's)

Polyaromatic Hydrocarbons

- Pyrene
- Fluorene
- Indene
- 1,2,3,4-Tetrahydronaphthalene
- 1-Methylnaphthalene
- 2-Methylnaphthalene
- Beta-Chloronaphthalene
- Acenaphthalene
- Quinoline
- Acenaphthene
- Phenanthrene
- Fluoranthene

Chlorinated Benzenes

- 1,3-Dichlorobenzene
- 1,2-Dichlorobenzene
- 1,4-Dichlorobenzene
- 1,3,5-Trichlorobenzene
- 1,2,3-Trichlorobenzene
- 1,2,3,4-Techchlorobenzene
- Pentachlorobenzene
- Hexachlorobenzene

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ-122

PROJECT TITLE: NORTHWESTERN ONTARIO NETWORK

NATIONAL PROGRAM NAME Toxic Chemicals C&P CODE 4.1

STUDY TEAM: J. Merriman and J. Fischer

GOALS:

1) Maintain a network of 4 stations in Northwestern Ontario for trace organic contaminants sampling on a monthly basis.
2) Submit a final draft report outlining a summary of water quality conditions. on all stations between 1979-85 to IWD Tech. Report Series by October 1986.
3) Complete one survey of water, sediment and biota from the Rainy River by by September 1986.

RATIONALE: These rivers are of international and interprovincial significance. Monitoring water quality conditions on these interjurisdictional waters will provide a long term database for future reference. The sediment survey on the Rainy River is being carried out as part of on inter-agency study for the Rainy River Water Pollution Control Board.

DESCRIPTION: Four stations on the Rainy, English and Winnipeg Rivers will be sampled monthly by local collectors for OC's & PCB's .

A draft report on the water quality of the Rainy River will be finalized by October 1986.

Duties on the Rainy River Study Plan Workshop will be carried out as required under the direction of the Rainy River Pollution Control Board.

Suspended and bottom sediments will be sampled as part of a special survey on the Rainy River by September 1986.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS
TURNAROUND TIME 60d

	Division	Total
PY TECH.	0.2	
PROF.	0.4	
TOTAL PY	0.6	
SALARIES	25.82	
O&M	5.5	
CONTRACTS		
CAPITAL		
TOTAL $	31.32	

SAMPLING STATIONS
NORTHWESTERN ONTARIO NETWORK

Map No.	NAQUADAT NO.	STATION LOCATION
5	000N05PC0002	Rainy River at outlet of Rainy Lake
6	000N05PD0001	Rainy River at outlet of Lake of the Woods
7	000N05PE0002	Winnipeg River at Whitedog Falls Generating Station
8	000N05QE0002	English River at Caribou Falls Generating Station

PARAMETER LIST

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCBs)

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ- 123

PROJECT TITLE: WATER QUALITY MONITORING OF THE OTTAWA RIVER

NATIONAL PROGRAM NAME TOXIC CHEMICALS

C&P CODE 4.1

STUDY TEAM: R. McCrea and J. Fischer

GOALS:

(1) To monitor on a monthly basis concentrations of organochlorine contaminants and heavy metals at three locations in the Ottawa River.

(2) Prepare a comprehensive report detailing the water chemistry of the Ottawa River in the National Capital Region (Dec. 86); report to be submitted for publication in one of the IWD Report Series.

RATIONALE: To provide comprehensive water quality data sets suitable for establishing spatial and temporal trends in the Ottawa River, and assessing the suitability of and compliance with water quality objectives being established for the river.

DESCRIPTION: Water samples will be collected on a monthly basis for contaminants at three other locations: Lake Timiskaming, Pembroke and Hawkesbury (Goal 1).

Considerable time and effort will be spent preparing figures, graphs and report writing (Goal 2).

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS
TURNAROUND TIME ______

	Laboratory	Division	Total
PY TECH.	0.09	0.2	0.29
PROF.			
TOTAL PY	0.09	0.5	0.59
SALARIES	3.12	21.51	24.63
O&M	-	3.1	3.10
CONTRACTS	-	-	-
CAPITAL	-	-	-
TOTAL $	3.12	24.61	27.73

SAMPLING STATIONS
OTTAWA RIVER

Map No.	NAQUADAT NO.	STATION LOCATION
34	---	Lake Timiskaming
35	---	Ottawa River at Pembroke
36	---	Ottawa River at Hawkesbury

PARAMETER LIST

pH
Specific Conductance
Turbidity
Total Alkalinity
DOC

Metals - Al (ext), Total Fe, Total Zn, Total Mn, Total Cu, Total Pb, As, Hg

Organics

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Total PCB's

Chlorinated Benzenes

1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3,4-Tetrachlorobenzene
Pentachlorobenzene
Hexachlorobenzene

PROJECT DESCRIPTION REGION/HQ Ontario
WATER QUALITY BRANCH - 1986/87 PROJECT NO: WQ- 125, 130

PROJECT TITLE: Water Quality Branch Regional Management and Administration, Activities Co-ordination and Agreement Negotiation

NATIONAL PROGRAM NAME Canada - U.S. and Interjurisdictional Water Management
Water Quality Management Data C&P CODE: 1.1, 1.3, 4.1
Toxic Chemicals

DURATION Ongoing

STUDY TEAM: F.J. Philbert, N.D. Warry, S. Metikosh, V. Walker, Vacant
(416) 336-4641

GOALS:

1) To manage and administer the Branch's operation effectively and efficiently.

2) To complete at least 4 negotiation meetings with the Province of Ontario by March 31, 1987.

3) To prepare a draft strategy document for negotiation with Ontario by June, 1986.

4) To participate as required in the WQB Agreements Co-ordinating Committee.

5) To provide typing and administrative support to WQB-OR.

RATIONALE: This project relates to the WQB mandate to maintain effective and effecient water quality monitoring and assessment programs in the region.

DESCRIPTION: To achieve goal 2 will require:

(a) The preparation of all necessary background documents for each meeting.
(b) Attendance and participation in meetings with Ontario, co-ordination with H.Q. staff.

To achieve goal 3 will require:

(a) Review of pertinent documentation available
(b) Co-ordination with headquarters staff re necessary requirements, negotiation goals, etc.

To achieve goal 4 will require:

(a) Attending at least 3 meetings with H.Q. and regional staff.
(b) Preparing draft materials and documents for a national co-ordinated strategy for water quality agreements.
(c) Conducting field trips and excursions to other regions to exchange technical information regarding sample collection activities to ensure consistency across the country.

To achieve goal 5 will require ongoing co-ordination and support.

ACCEPTABLE ANALYSIS
TURNAROUND TIME 60d

RESOURCES ($'000)	1986/87 Total
PY TECH.	1.0
PROF.	2.5
TOTAL PY	3.5
SALARIES	150.6
O&M	48.0
CONTRACTS	
CAPITAL	
TOTAL $	198.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ- 134

PROJECT TITLE: Continuous Sampling of Organic Contaminants in the Niagara River

NATIONAL PROGRAM NAME Toxic Chemicals

C&P CODE 4.1

STUDY TEAM: R. McCrea and J. Fischer

GOALS:

(1) To design and have constructed permanent intake systems at Niagara-on-the-Lake and Ft. Erie for the collection of water samples (by Oct./86).

(2) Complete final modifications of the continuous sampling system, give a talk on the general operation of the system at a WQB Workshop (May, 1986) and prepare document on the same (July 1986).

(3) To collect time-integrated suspended sediment samples and aqueous extracts on a weekly basis at Niagara-on-the-Lake, June - Dec. 1986.

(4) Prepare a detailed report on the construction and operation of the continuous sampling system (Jan. 1987). The report will be submitted for publication in one of the IWD Report Series.

(5) Complete assessment and prepare a validation report on the entire system with Dr. P. Goulden, NWRI, (Jan. 1987).

RATIONALE: A wide range of organochlorine contaminants have been idnetified in recent years in the niagara River. It is thought that there are several major sources of the contaminants, which include: industrial and municpal outflows and leachates from chemical waste dumps. The resulting river contaminantion has been shown to be variable on a temporal basis. The continuous sampling system will be used to collect time-integrated samples on a wekkly basis for both the aqueous and seston fractions.

DESCRIPTION: Final monidifications will be completed by June 1986; samples of both fractions will be collected on a weekly basis (Goals I and II).

Considerable time and effort will be spent preparing graphs , figures and report writing (Goals 3,4 and 5).

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS
TURNAROUND TIME ______

	Laboratory	Monitoring & Agreements Div.	Total
PY TECH.	1.69	0.4	2.09
PROF.	-	0.35	.35
TOTAL PY	1.69	0.75	2.44
SALARIES	58.72	32.27	90.99
O&M	-	7.0	7.0
CONTRACTS	-		
CAPITAL	-	10.0	10.0
TOTAL $	58.72	49.27	107.99

SAMPLING STATIONS
FOR THE CONTINUOUS SAMPLING OF ORGANIC CONTAMINANTS IN THE NIAGARA RIVER

Map No.	NAQUADAT No.	Station Location
1	000N02HA0019	Niagara River at Niagara-on-the-Lake

PARAMETER LIST

DCM extract analyses for spike recovery only analyses to be conducted.

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/87

REGION/HQ Ontario
PROJECT NO: WQ- 135

PROJECT TITLE: OTTAWA RIVER SPECIAL STUDY

NATIONAL PROGRAM NAME Toxic Chemicals C&P Code: 4.1

STUDY TEAM: J. Merriman

GOALS:

1) To jointly submit with NWRI, a final draft report to IWD Tech. Series which discusses contaminant levels in water, sediment and selected biota of the Ottawa River by March 1987.
2) To complete a single survey of water, sediment and biota at 2 sites on the lower Ottawa River by July, 1986.
3) To submit to IWD Tech. Series, a report detailing results of NCR water surveys by Dec. 1986.
4) To provide input, as required to the Ottawa River Technical Subcommittee.

RATIONALE: Previous work has shown both elevated levels of metals and organic contaminants in various reaches of the Ottawa River. This study will provide information on the best media to sample in and ongoing program to monitor contaminant levels.

DESCRIPTION: Sampling at two sites will include water, sediment and biota.

A report based on the 1985 surveys will be completed by March, 1987.

RESOURCES ($'000) 1986/87

ACCEPTABLE ANALYSIS
TURNAROUND TIME 60d

	Laboratory	Monitoring & Agreements Division	Total
PY TECH.	-	-	-
PROF.	-	0.2	0.2
TOTAL PY	-	0.2	0.2
SALARIES	-	8.62	8.62
O&M	-	5.5	5.5
CONTRACTS	-	-	-
CAPITAL	-	-	-
TOTAL $	-	14.12	14.12

SAMPLING STATIONS
OTTAWA RIVER SPECIAL STUDY

Map No.	NAQUADAT NO.	STATION LOCATION
39	---	Along Transect of the Lower Ottawa River near Treadwell
40	---	Along Transect of the Lower Ottawa River near Carillon

PARAMETER LIST

Organochlorine Pesticides

P,P-DDT
O,P-DDT
P,P-TDE
P,P-DDE
P,P-Methoxychlor
Heptachlor
Heptachlor Epxide
Alpha-Endosulfan
Beta-Endosulfan
Alpha-(cis) Chlordane
Gamma-(trans) Chlordane
Alpha-BHC
Gamma-BHC
Mirex
Aldrin
Endrin
HEOD (dieldrin)

Araclor Total (PCB's)

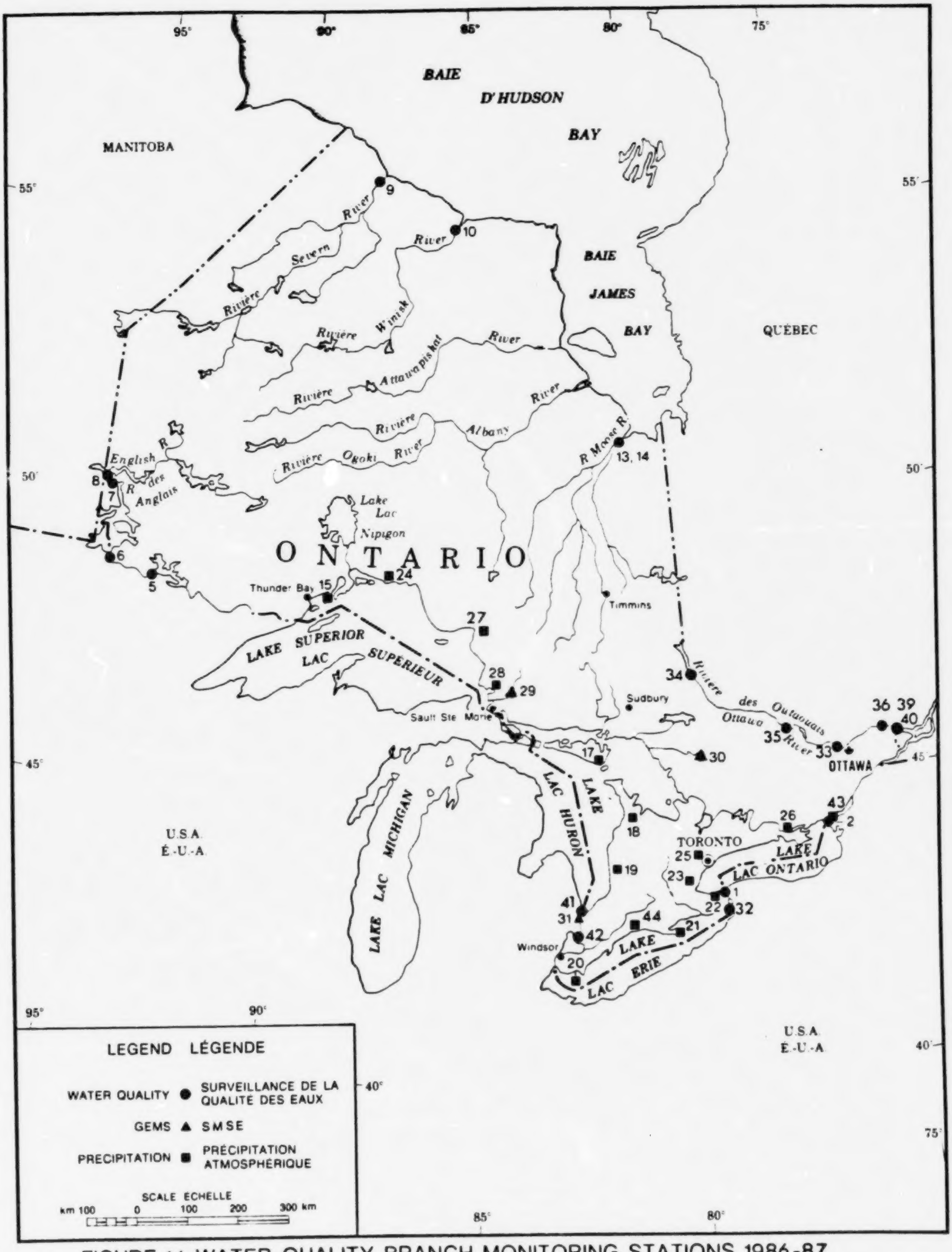
Polyaromatic Hydrocarbons

Pyrene
Fluroene
Indene
1,2,3,4 Tetrahydronapthalene
1-Methylnaphthalene
2-Methylnaphthalene
Beta-Chloronaphthalene
Acenaphthalene
Quinoline
Acenaphthene
Phenanthrene
Fluoranthene

Chlorinated Benzenes

1,3-Dichlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,3,5-Trichlorobenzene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,3,4-Tetrachlorobenzene
Pentachlorobenzene
Hexachlorobenzene*

N.B. No analytical time has been identified for these analyses.


95°
90°
85°
80°
75°
BAIE
D'HUDSON
BAY
MANITOBA
55°
9
River
Severn
Rivière
10
River
Winisk
Rivière
BAIE
JAMES
BAY
QUÉBEC
Rivière
Attawapiskat
River
Rivière
River
Albany
Rivière
Ogoki
River
R Moose R.
13, 14
English
R
R des
Anglais
8
7
50°
Lake
Lac
Nipigon
ONTARIO
6
5
Thunder Bay
15
24
Timmins
27
LAKE SUPERIOR
LAC SUPERIEUR
34
Rivière des Outaouais
Ottawa River
28
29
Sudbury
Sault Ste Marie
36
39
40
35
33
OTTAWA
17
30
45°
LAC HURON
LAKE
LAKE LAC MICHIGAN
18
43
2
26
U.S.A.
É.-U.-A.
TORONTO
25
LAKE
LAC ONTARIO
19
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1
41
22
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31
44
21
42
Windsor
LAKE
ERIE
LAC
20
40°
LEGEND LÉGENDE
WATER QUALITY ● SURVEILLANCE DE LA QUALITÉ DES EAUX
GEMS ▲ SMSE
PRECIPITATION ■ PRÉCIPITATION ATMOSPHÉRIQUE
SCALE ÉCHELLE
km 100 0 100 200 300 km

FIGURE 14 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ
DES EAUX 1986-87

D.4 WESTERN AND NORTHERN REGION

Région du l'Ouest et du Nord

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PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: W&N
Project Number :

PROJECT TITLE: SUPPORT SERVICES

NATIONAL PROGRAM NAME: Canada/U.S. Interjurisdictional Water Management
Water Quality Management Data
Toxic Chemicals

C&P CODE: 1.1, 1.3, 4.1

GOALS:

1. To provide services of a general nature not attributable to specific projects.
2. To account for projects to be planned during the fiscal year.

RATIONALE: In support of Water Quality Branch projects.

DESCRIPTION:

1. Overhead activities such as planning, attendance at meetings and workshops, review of proposals and reports, correspondence, staffing, job evaluations and other miscellaneous administrative tasks.
2. Includes resources for projects to be planned during the upcoming fiscal year for;

   (a) Toxic chemicals
   (b) Water Quality Objectives

RESOURCES: A-Base ($'000)

PY	6.3
Salary	259.3
O&M	271.0
Contracts	-
Capital	52.0*
Total	528.3

* Includes EDP aquisition funds not included in other projects

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
01-86 Interjurisdictional Monitoring by WRB

SUBMITTER - 0001
C&P PROGRAM - 1.1* - Canada-U.S. and Interjurisdictional Waters
DURATION - Ongoing

OBJECTIVES
To conduct monthly or time of visit water quality surveys at designated interjurisdictional locations; to prepare the data collected from these sites for the detailed data and water quality interpretive reports.

RATIONALE
This project contributes to the administration of the Boundary Waters Treaty of 1909 by making available water quality data from three international river systems. As well, samples are collected from four remote northern interprovincial rivers.

DESCRIPTION
Monthly or time of visit samples are collected for a wide spectrum of parameters by Water Survey of Canada. The governments concerned are notified of potential and existing problems. Depending on the magnitude of the problem, External Affairs may be notified. The data are reviewed on an annual basis to assess the relative quality of the boundary streams.

COORDINATOR(S) - Block (Alta.) Chacko (Man.) Crosley (Sask.)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.04		0.04
	PY Tech	0.15	0.06	0.11		0.32
	Salary	5.1	2.2	5.25		12.55
	O & M	2.5	1.0	3.70		7.20
	Capital	0.7	0.3	1.85		2.85
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.15	0.06	0.15		0.36
Total Dollars		8.3	3.5	10.80		22.60

* Affiliated C&P Program(s) - 1.3

301-86 Interjurisdictional Monitoring by WRB

INDICATORS - A-1-A
PRIORITY - Relative Rank 5, Sample Turnaround Time 90 Days

DISSEMINATION OF LABORATORY DATA REPORTS

1 Project Coordinators

2 WESTORE

3 NAQUADAT

4 Manitoba data - Mr. D. Brown, Environmental Management Service, Building 2, Box 7, 139 Tuxedo Avenue Winnipeg, Manitoba R3N OH6

5 Saskatchewan data - Director, Water Pollution Control Branch Saskatchewan Environment 3085 Albert Street Regina, Saskatchewan

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Update project description	April	
2 WRB undertakes fieldwork	ongoing	Time of visit sampling
3 Lab analysis	ongoing	Reports due 8 weeks from date of receipt of samples
4 Data verification	ongoing	
5 Data publication		As per work plan

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
52	Battle Creek near International Boundary	00SA11AB0005	M
53	Frenchman River at the 49th Parallel	00SA11AC0002	M
54	Lodge Creek near Willow Creek	00SA11AB0007	M
59	Nelson River near mouth of Weier River	00MA05UH0001	V
60	Hayes River below Junction with God's River	00MA04AB0001	V
61	Churchill River above Red Head Rapids	00MA06FD0002	V
62	Cochrane River near Brochet Manitoba	00MA06DA0001	V

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
301-86 Interjurisdictional Monitoring by WRB

SAMPLING MATRIX

Schema	LAB	Parms	Stns 52,54	Stn 53	Stns 59,61,62	Stn 60	Total
SA2	F	Phys(F)	M	M	V	V	37
SB1	F	Coliform	M	M			19
SC1	B	MajorIon	M	M	V	V	37
SC2	S	Phys(L)	M	M	V	V	37
SC3	S	NFR	M	M	V	V	37
SD2	S	Nutrients	M	M	V	V	37
SE1	B	T Metals		M	V	V	26
SE3	B	Fe-Mn(Ext)		M	V	V	26
SF3	B	As-Se(L)	M	M	V	V	37
SF4	S	B(L)	M	M	V	V	37
SG1	S	Cn		M			8
SH1	B	Herbs(Old)		M		V	12
SM1	B	Herbs(Old)		M		V	12
SH4	B	Herbs(Neut)		V			8
SH5	B	OC-PCB		M		V	12
SH8	S	Phenol		M			8

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 301 Samples	Proj 301 TMU's	Proj 301 Cost
SA2	F	Phys(F)	37		
SB1	F	Coliform	19		
SC1	B	MajorIon	37	34.04	1740.85
SC2	S	Phys(L)	37		423.65
SC3	S	NFR	37		321.53
SD2	S	Nutrients	37		2437.19
SE1	B	T Metals	26	21.84	1199.12
SE3	B	Fe-Mn(Ext)	26	1.04	57.20
SF3	B	As-Se(L)	37	11.10	609.39
SF4	S	B(L)	37		203.13
SG1	S	Cn	8		36.64
SH1	B	Herbs(Old)	12	60.00	2811.60
SM1	B	Herbs(Old)	12		
SH5	B	OC-PCB	12	40.80	1911.84
SH8	S	Phenol	8		109.76
TOTAL	S		164	0.00	3531.90
TOTAL	B		162	168.82	8330.00
G TOTAL			382	168.82	11861.90

304-86 Interjurisdictional Monitoring by WQB

SUBMITTER - 0003
C&P PROGRAM - 1.1* - Canada-U.S. and Interjurisdictional Waters
DURATION - Ongoing since 1978

OBJECTIVES

To report on the water quality at interjurisdicational stations and provide data for the administration of the Boundary Waters Treaty and Federal/Provincial Water Management programs.

RATIONALE

The Water Quality Branch contributes to the administration of the Boundary Waters Treaty of 1909 by making available water quality data obtained at border locations of international river systems.

DESCRIPTION

Samples are collected monthly for a wide variety of parameters from 23 interjurisdictional stations. The data are verified before dissemination. Unusual values may be followed up with re-surveys. The governments concerned are notified of potential and real problems. Depending on the magnitude of the international concerns, External Affairs may be notified. The data are reviewed on an annual basis for publication.

COORDINATOR(S) - Block (Alta), Chacko (Man), Crosley (Sask)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.67		0.67
	PY Tech	1.55	0.45	0.88		2.88
	Salary	54.4	15.7	54.25		124.4
	O & M	27.3	7.9	30.72		65.9
	Capital	7.5	2.2	15.36		25.36
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		1.55	0.45	1.55		3.55
Total Dollars		89.2	25.7	100.33		215.2

* Affiliated C&P Program(s) - 1.3

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
1	Milk River at Eastern Crossing of International Boundary	00AL11AA0003	M
2	Milk River at Western Crossing of International Boundary	00AL11AA0002	M
3	North Milk River at International Boundary	00AL11AA0001	M
4	St. Mary's River near International Boundary	00AL05AE0001	M
5	Belly River at Highway # 6	00AL05AD0060	M
6	Waterton River at Highway # 6	00AL05AD0005	M
7	East Poplar River at International Boundary	00SA11AE0008	M
8	Long Creek South of Torquay	00SA05NA0002	M
9	Long Creek near Noonan	00US05NB0001	M
10	Souris River near Glen Ewen	00SA05ND0001	M
12	Souris River at Coulter	00MA05NF0001	M
14	Pembina River at Windygate	00MA05OB0001	M
16	Roseau River at Gardenton	00MA05OD0001	M
19	Pipestone Creek at Highway 255	00MA05NG0013	M
20	Winnipeg River at Pointe du Bois	00MA05PF0022	M
21	Manigotagan River at Highway 304	00MA05RA0004	M

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
304-86 Interjurisdictional Monitoring by WQB

SAMPLING MATRIX

Schema	LAB	Parms	Stns 9,10, 19,20	Stns 1,12	Stns 4,6, 14,16	Stns 2,3, 5,21	Stn 7	Stn 8	Total
SA1	F	Phys(F)	M	M	M	M	M	M	192
SB1	F	Coliform	M	M	M	M	M	M	192
SB3	S	Chlor(F)	M	M	M	M	M	M	192
SC1	B	MajorIon	M	M	M	M	M	M	192
SC2	S	Phys(L)	M	M	M	M	M	M	192
SC3	S	NFR	M	M	M	M	M	M	192
SD1	S	Nutrients	M	M	M	M	M	M	192
SE1	B	T Metals	M	M	M		M	M	144
SE2	B	Fe-Mn(Diss)	M	M	M	M	M	M	192
SE4	B	Al(Ext)					M		12
SE5	B	Al(Diss)					M		12
SE6	B	Cr(T)					M		12
SE7	B	Hg(T)	M	M	M	M	M	M	192
SF1	B	As-Se(F)	M	M	M	M	M	M	192
SF2	S	B(F)	M	M	M	M	M	M	192
SG1	S	Cn	M	M	M		M		132
SH1	B	Herbs(Old)	M	M	M		M		132
SM1	B	Herbs(Old)	M						48
SH2	B	Herbs(New)		V	V		V		56
SH3	B	Picloram		V	V		V		56
SH4	B	Herbs(Neut)		V					16
SH5	B	OC-PCB	M	M	M		M		132
SH8	S	Phenol	M	M	M		M		132

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
306-86 International Automatic Water Quality Monitoring

SUBMITTER - 0140
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES

(1) To provide continuous surveillance of the Red River at the Canada - U.S. border in order to detect and document the effect of any industrial and municipal waste spills and other pollution sources originating in the U.S. (2) To acquire water quality data in order to meet obligation of the Red River Pollution Control Board, IJC.

RATIONALE

Under IJC the Red River monitoring was established in 1968 to provide a continuous surveillance of the water quality at the Canada - U.S. border at Emerson. Since 1977, the potential effect of the Garrison Diversion on the Red River water quality has provided an additional reason for maintaining this monitor.

DESCRIPTION

A Schneider Robot RM25 monitor is operated on a continuous basis on the Red River at Emerson. Parameters measured are DO, pH, conductivity, chloride and temperature. Data are collected and transmitted using a LaBarge DCP via GOES satellite and stored at Camp Springs, MD. These data are retrieved and decoded by the Branch computer in Regina. Computed monthly data are distributed to various agencies. Monthly samples are also collected to allow monitor to laboratory comparisons, and, to supplement the monthly reports with complete parametric coverage. Included in this project will be the calibration and evaluation of a second chloride measuring unit as well as installation and operation of a Schneider Model MCT-2 data storage and transmission unit. Installation and initial calibration by the supplier may be required.

COORDINATOR(S) - Chacko

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.15		0.15
	PY Tech	0.21	0.03	0.35		0.59
	Salary	7.2	1.0	17.20		25.4
	O & M	3.6	0.5	6.50		10.6
	Capital	1.0	0.1	2.00		3.1
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.21	0.03	0.50		0.74
Total Dollars		11.8	1.6	25.70		39.1

306-86 International Automatic Water Quality Monitoring

INDICATORS - A-1-A a,b,c,g
PRIORITY - Relative Rank 1, Sample Turnaround Time 30 Days

DISSEMINATION OF LABORATORY DATA REPORTS
1 Project Coordinator(s)

2 WESTORE

3 NAQUADAT

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Operate on a real time basis the continuous water quality monitor	ongoing	
2 Submit a grab sample by the 10th of the month for lab analysis	ongoing	
3 Prepare and distribute monthly reports within 30 days	ongoing	
4 Report unusual water quality conditions within 48 hours of detection	ongoing	
5 Revise automonitor report format and distribute to RRPB members for comment	September	
6 Finalize revised automonitor report format	December	
7 Attend one meeting of RRPB as Canadian secretary	January	Annual report will be prepared by Canada

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
15	Red River at Emerson	00MA050C0001	M

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
06-86 International Automatic Water Quality Monitoring

SAMPLING MATRIX

Schema	LAB	Parms	Stn 15	Total
SA1	F	Phys(F)	M	12
SB1	F	Coliform	M	12
SB3	S	Chlor(F)	M	12
SC1	B	MajorIon	M	12
SC2	S	Phys(L)	M	12
SC3	S	NFR	M	12
SD1	S	Nutrients	M	12
SE1	B	T Metals	M	12
SE2	B	Fe-Mn(Diss)	M	12
SE4	B	Al(Ext)	M	12
SE5	B	Al(Diss)	M	12
SE7	B	Hg(T)	M	12
SF1	B	As-Se(F)	M	12
SF2	S	B(F)	M	12
SG1	S	Cn	M	12
SH1	B	Herbs(Old)	M	12
SH2	B	Herbs(New)	M	12
SH3	B	Picloram	M	12
SH4	B	Herbs(Neut)	M	12
SH5	B	OC-PCB	M	12
SH8	S	Phenol	M	12

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
307-86 National Radionuclide Monitoring

SUBMITTER - 0007
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing since 1980.

OBJECTIVES

To measure and assess the significance of radionuclides in waters of federal interest.

RATIONALE

Radiation emitted by radionuclides is harmful to humans, causing damage at both the cellular and molecular levels. The main effect on the individual at low dose levels is the induction of cancer, such as leukemia, while very high dose levels result in death. In addition to somatic changes which affect the individual, genetic changes can also occur which affect the offspring for several generations.

DESCRIPTION

Samples are composited to make quarterly and annual samples for analysis. Four (4) litre samples are collected monthly in polyethylene containers and acidified with 8 ml. concentrated HCL as a preservative. From these monthly samples a composite five (5) litre sample is sent to NWRI for analysis.

Stations monitored under this project are included in other projects as follows: Souris River at Coulter and East Poplar River at International Boundary in Project 304, Baker Lake 1.6 km from Baker Lake in Project 390, Saskatchewan River above Carrot River in Project 315, and Red River at Emerson in Project 306. Samples from the East Poplar,Souris and Red River sites are analyzed quarterly while those from the the Saskatchewan River and Baker Lake are analyzed annually. To date, none of the sampling stations in the Western and Northern Region have exhibited significant trends in the concentration of radionuclides in surface waters. This has given rise to a reassessment of the program, as described below.

COORDINATOR(S) - D. McNaughton Ground Water Division, NHRI, Saskatoon.

RESOURCES ($ 000.)

		Nat Lab	Reg Lab	Field	Admin	Total
A Base	PY Prof		0.01			0.01
	PY Tech		0.04			0.04
	Salary		1.8			1.8
	O&M		2.0			2.0
	Cap					
PY Total			0.05			0.05
Total Dollars			3.8			3.8

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
308-86 Revised Red River Monthly Report Format

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - 1986/87

OBJECTIVES

1. to provide useful, comprehensive monthly data reports for the Red River monitor by placing these data in the context of the historical data

2. to provide direct input to the annual report

RATIONALE

Under the International Joint Commission (IJC) directives, the Branch operates a continuous water quality monitor on the Red River at Emerson. These data must be reported monthly and annually relative to trends and objectives in an effective manner.

DESCRIPTION

At the present time, monthly reports contain only data for a single month. The lack of a historical data reference for these reports frequently causes water quality changes which are consistent with historical patterns to be of concern or alternatively, may result in deviations from the "historical norm" to be unnoticed. This revised report format will provide ready comparison with data from the preceding 11 months as well as the long term patterns. Additionally, the December report will be directly applicable to the annual report.

COORDINATOR(S) - Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.05		0.05
	PY Tech			0.1		0.1
	Salary			5.25		5.25
	O & M			10.0		10.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.15		0.15
Total Dollars				15.25		15.25

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
310-86 Canada - Alberta Monitoring Agreement by WQB

SUBMITTER - 0479
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES

To conduct monthly water quality surveys at selected sites identified under the Agreement; to prepare the data for: monthly reports to Alberta DOE; the Regional ambient water quality data reports, and; the annual report on the quality of the aquatic environment (see Project 304).

RATIONALE

The Branch is in the process of negotiating a formal agreement with Alberta Environment to monitor the quality of surface water at twelve locations on a monthly bases during FY 86/87. The Branch anticipates that by April 1986, the Ad-Hoc Agreement will be replaced with a formal federal-provincial water quality Agreement. Discussions regarding the details of this formal Agreement are taking place.

DESCRIPTION

Since 1977 the Branch has annually negotiated an ad-hoc agreement with Alberta Environment. Under the terms of the Ad-Hoc Agreement samples are collected monthly by the Branch and WRB and are analyzed by the Branch. The data are verified and reported to Alberta Environment. The data also support the objectives of the Aquatic Quality Measurement and Assessment Subprogram. Because of federal interest at some sites, the program is cost shared by the two governments.

COORDINATOR(S) - Block

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.06		0.06
	PY Tech	0.09	0.05	0.16		0.30
	Salary	3.19	1.70	7.85		12.74
	O & M	1.91	1.02	4.32		7.25
	Capital	1.28	0.68	2.20		4.16
Recov.	PY Prof			0.32		0.32
	PY Tech	0.45	0.24	0.76		1.45
	Salary	15.95	8.48	39.28		63.71
	O & M	9.57	5.09	21.55		36.21
	Capital	6.38	3.39	10.95		20.72
PY Total		0.54	0.29	1.30		2.13
Total Dollars		38.28	20.36	86.15		144.79

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
[illegible]0-86 Canada - Alberta Monitoring Agreement by WQB

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
33	Oldman River at Highway # 36 Bridge	00AL05AG0001	M
34	Oldman River near Lethbridge	00AL05AD0002	M
35	Bow River near the mouth	00AL05BN0001	M
36	Bow River at Cochrane	00AL05BH0017	M
37	Red Deer River at Drumheller	00AL05CE0001	M
38	Red Deer River above Red Deer	00AL05CC0004	M
39	North Saskatchewan River at Devon	00AL05DF0008	M
40	North Saskatchewan River at Pakan Bridge	00AL05EC0005	M
41	Athabasca River at Athabasca	00AL07BE0001	M
42	Smoky River at Watino	00AL07GJ0001	M
43	Peace River at Highway # 2, Dunvegan	00AL07FD0002	M
TBA	Bow River at Carseland	00AL05BM0002	M

Notes: 1) The sampling of the Bow River at Carseland will commence with the signing of the formal Agreement.
2) Sites 42 and 43 are actually sampled under project 311-86 but are included here as they were in previous years. The costs for operating these two sites are also included in the resource tables which follow.

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
310-86 Canada - Alberta Monitoring Agreement by WQB

SAMPLING MATRIX

Schema	LAB	Parms	Stations 33 to 41, and TBA (10 sites)	Stations 42,43 (2 sites)	Total (12 sites)
SA1	F	Phys(F)	M	-	120
SA2	F	Phys(F)	-	M	24
SB1	F	Coliform	M	M	144
SB2	F	Strep	M	M	144
SB3	S	Chlor(F)	M	-	120
SC1	B	MajorIon	M	M	144
SC2	S	Phys(L)	M	M	144
SC3	S	NFR	M	M	144
SD1	S	Nutrients	M	-	120
SD2	S	Nutrients	-	M	24
SD5	S	NH3	-	M	24
SE1	B	T Metals	Q	Q	48
SE2	B	Fe-Mn(Diss)	M	-	120
SE3	B	Fe-Mn(Ext)	-	Q	8
SE7	B	Hg(T)	M	-	120
SE8	B	Ag(Ext)	Q	Q	48
SF1	B	As-Se(F)	M	-	120
SF2	S	B(F)	M	-	120
SF3	B	As-Se(L)	-	M	24
SF4	S	B(L)	-	M	24
SH1	B	Herbs(Old)	Q	Q	48
SM1	B	Herbs(Old)	Q	Q	48
SH5	B	OC-PCB	Q	Q	48
SH7	B	WOP1	Q	Q	48
SH8	S	Phenol	M	M	144

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
3[illegible]1-86 Canada - Alberta Monitoring Agreement by WRB

SUBMITTER - 0001
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES
See Project 310

RATIONALE
See Project 310

DESCRIPTION
Sampling at two sites under the Alberta-Canada Agreement is carried out by WRB. This project is integrally linked to project 310. For this reason, the resources of the two projects are presented together in the description for project 310. For further information see project 310.

COORDINATOR(S) - Block

RESOURCES
N/A

INDICATORS - A-2-1 a
PRIORITY - See Project 310

DISSEMINATION OF LABORATORY DATA REPORTS
See Project 310-86

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 See Project 310		

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
42	Smoky River at Watino	00AL07GJ0001	M
43	Peace River at Highway # 2, Dunvegan	00AL07FD0002	M

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
312-86 Northern Saskatchewan Monitoring Agreement

SUBMITTER - 0001
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES

(1) To conduct quarterly water quality surveys at sites identified in the agreement. (2) To prepare quarterly data reports for the Saskatchewan Government.

RATIONALE

The Branch and Saskatchewan DOE both have need of ongoing water quality data for these interjurisdictional river systems. The Saskatchewan and Canadian governments, recognizing an opportunity to reduce monitoring costs in Northern Saskatchewan, have negotiated a cost-sharing agreement.

DESCRIPTION

Samples are collected quarterly from 5 river locations in N. Saskatchewan and analyzed by WQB. Radionuclide samples are collected as well, with analyses done by SRC. In addition, samples of lake water and snow are collected from approximately 30 locations at various times of the year to provide information on LRTAP. Analyses of these samples are performed by SRC. Sites are accessible by air only. During 1986-87, collection will be done by WQB. The data are reviewed and reported quarterly.

COORDINATOR(S) - Crosley

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof					
	PY Tech	0.03		0.03		0.06
	Salary	0.99		1.00		1.99
	O & M	0.50		0.90		1.40
	Capital	0.14				0.14
Recov.	PY Prof					
	PY Tech	0.05	0.05	0.09		0.19
	Salary	1.58	1.71	3.28		6.57
	O & M	0.79	0.86	15.69		17.34
	Capital	0.22	0.23	0.50		0.95
PY Total		0.08	0.05	0.12		0.25
Total Dollars		4.22	2.80	21.37		28.39

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
12-86 Northern Saskatchewan Monitoring Agreement

INDICATORS - A-2-1 b(iv)
PRIORITY - Relative Rank 4. Sample Turnaround Time 30 Days

DISSEMINATION OF LABORATORY DATA REPORTS

1 Project Coordinator(s)

2 WESTORE

3 NAQUADAT

4 Director, Water Pollution Control Branch, Saskatchewan Environment, Regina, Saskatchewan

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Sampling	ongoing	
2 Analysis	ongoing	Relative Rank 4, 12 week turnaround time
3 Data reports		To Saskatchewan Environment quarterly

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
64	Fond du Lac River at outlet of Black Lake	00SA07LC0001	Q
65	Beaver River above Beauval	00SA06AG0004	Q
66	Geike River below junction with Wheeler River	00SA06DA0001	Q
67	Churchill River at Otter Rapids	00SA06CD0001	Q
68	Churchill River near Patuanak	00SA06BB0004	Q

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
312-86 Northern Saskatchewan Monitoring Agreement

SAMPLING MATRIX

Schema	LAB	Parms	Stns 64,65,66,67	Stn 68	Total
SA2	F	Phys(F)	Q	Q	20
SB4	S	Chlor(L)	Q	Q	20
SC1	B	MajorIon	Q	Q	20
SC2	S	Phys(L)	Q	Q	20
SC3	S	NFR	Q	Q	20
SD2	S	Nutrients	Q	Q	20
SD4	S	DIC	Q	Q	20
SE1	B	T Metals	Q	Q	20
SE3	B	Fe-Mn(Ext)	Q	Q	20
SE6	B	Cr(T)	Q	Q	20
SE8	B	Ag(Ext)	Q	Q	20
SE9	B	Mo(Ext)	Q	Q	20
SF3	B	As-Se(L)	Q	Q	20
SF4	S	B(L)	Q	Q	20
SG1	S	Cn	Q	Q	20
SH1	B	Herbs(Old)		Q	4
SM1	B	Herbs(Old)		Q	4
SH5	B	OC-PCB		Q	4
SH8	S	Phenol		Q	4

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 312 samples	Proj 312 TMU's	Proj 312 Cost
SA2	F	Phys(F)	20		
SB4	S	Chlor(L)	20		604.00
SC1	B	MajorIon	20	18.4	941.00
SC2	S	Phys(L)	20		229.00
SC3	S	NFR	20		173.80
SD2	S	Nutrients	20		1317.40
SD4	S	DIC	20		183.00
SE1	B	T Metals	20	16.8	922.40
SE3	B	Fe-Mn(Ext)	20	0.8	44.00
SE6	B	Cr(T)	20	6.0	329.40
SE8	B	Ag(Ext)	20	0.4	22.00
SE9	B	Mo(Ext)	20	0.4	22.00
SF3	B	As-Se(L)	20	6.0	329.40
SF4	S	B(L)	20		109.80
SG1	S	Cn	20		91.60
SH1	B	Herbs(Old)	4	20.0	937.20
SM1	B	Herbs(Old)	4		
SH5	B	OC-PCB	4	13.6	637.28
SH8	S	Phenol	4		54.88
TOTAL	S		144	0.0	2763.48
TOTAL	B		152	82.4	4184.68
G TOTAL			316	82.4	6948.16

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
313-86 Formalized Water Quality Agreement Development

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES

To negotiate and develop formalized agreements with the provinces of Manitoba, Saskatchewan and Alberta; to annually review and update these agreements.To take part as appropriate in similar negotiations regarding the NWT.

RATIONALE

In 1982 Water Quality Branch was directed by the Federal Cabinet to negotiate water quality agreements with the provinces. These agreements will fullfill the needs of both the provinces (data aquisition for management purposes) and the federal government (National Water Quality Assessment).

DESCRIPTION

Negotiations with the province of Alberta commenced in 1983 with a view to replacing the existing ad hoc arrangement (Projects 310, 311) with a formalized agreement. This formalized agreement will contain provisions for the sharing of field and analytical work. As well, other joint activities such as quality control/quality assurance studies, interpretive reporting and sediment and biological surveys will take place. Similar agreements are being negotiated with Manitoba (started in 1984) and Saskatchewan (started in 1985). Negotiations are scheduled to commence concerning the NWT in 1986-'87.

COORDINATOR(S) - Gummer,Vaughan

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	TOTALS
A Base	PY Prof			1.1		1.1
	PY Tech			0.1		0.1
	Salary			47.5		47.5
	O & M			9.5		9.5
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				1.2		1.2
Total Dollars				57.0		57.0

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
314-86 National Parks Monitoring Agreement

SUBMITTER - 0417
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES

To conduct monthly surveys at selected sites within the Rocky Mountain National Parks; to prepare detailed data reports on data obtained in 1983 and 1984; to develop an Agreement with Parks Canada for FY 87/88; to prepare an interpretive statement on monitoring data collected during the period 1980 to 1984.

RATIONALE

Parks Canada requested that the Branch establish and maintain a water quality network for the purpose of establishing and maintaining a baseline of surface water quality to optimize the use of Park waters. In addition, the Branch has an interest in these data since both the North and South Saskatchewan and the Athabasca Rivers originate in the Parks.

DESCRIPTION

Under the terms of the Agreement the Branch is committed to monthly monitoring for major ions, nutrients, bacteria and metals at five sites (with some IWD interest) in the Rocky Mt. Parks. The project is reviewed annually in cooperation with Parks Canada and is renewable with or without modification. Data are verified on a monthly basis and reported annually to Parks Canada.

COORDINATOR(S) - Block

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.01	0.029		0.039
	PY Tech	0.14	0.09	0.200		0.430
	Salary	2.78	3.02	16.990		22.790
	O & M	1.89	1.82	10.480		14.190
	Capital	1.34	1.28	2.790		5.410
Recov.	PY Prof			0.070		0.070
	PY Tech	0.07	0.05	0.180		0.300
	Salary	1.39	1.33	8.080		10.800
	O & M	0.95	0.91	4.430		6.290
	Capital			2.250		2.250
PY Total		0.21	0.15	0.479		0.839
Total Dollars		8.35	8.36	45.020		61.730

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
314-86 National Parks Monitoring Agreement

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
44	Bow River at Highway # 1 above Lake Louise	00AL05BA0011	M
45	Bow River 4.5 Km. above Canmore	00AL05BE0013	M
46	North Saskatchewan River at Whirlpool Point	00AL05DA0001	M
47	Athabasca River at Athabasca Falls	00AL07AA0015	M
48	Athabasca River at Highway # 16 below Snaring River	00AL07AA0023	M

SAMPLING MATRIX

Schema	LAB	Parms	Stations 45, 48	Stations 44,46,47	Total
SA1	F	Phys(F)	M	M	60
SB1	F	Coliform	M	M	60
SB2	F	Strep	M	M	60
SB3	S	Chlor(F)	M	M	60
SC1	B	MajorIon	M	M	60
SC2	S	Phys(L)	M	M	60
SC3	S	NFR	M	M	60
SD1	S	Nutrients	M	M	60
SE1	B	T Metals	M	-	24
SE2	B	Fe-Mn(Diss)	M	M	60
SE7	B	Hg(T)	M	M	60
SF1	B	As-Se(F)	M	M	60
SF2	S	B(F)	M	M	60
SG1	S	Cn	M	-	24
SH1	B	Herbs(Old)	M	-	24
SH2	B	Herbs(New)	V	-	16
SH3	B	Picloram	V	-	16
SH5	B	OC-PCB	M	-	24
SH8	S	Phenol	M	-	24

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
315-86 Prairie Provinces Water Board Monitoring

SUBMITTER - 0462
C&P PROGRAM - 1.1* - Interjurisdictional Water Management
DURATION - Ongoing since 1978

OBJECTIVES

1. To conduct monthly water quality surveys at eleven interprovincial locations.

2. To prepare monthly detailed data reports for the PPWB.

RATIONALE

The Branch, in order to fulfill its mandate and the terms of an agreement with the Prairie Provinces Water Board, is required to monitor the quality of selected interprovincial rivers.

DESCRIPTION

A total of eleven interprovincial sites are sampled monthly by the branch for a wide spectrum of parameters. The information obtained is verified monthly and reports are prepared for the PPWB. These stations represent river systems in both the Canadian Shield and Plains physiographic regions of the Western and Northern region.

COORDINATOR(S) - Crosley (Man., Sask.), Block (Alta.)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.80		0.80
	PY Tech	2.6	0.36	0.59		3.55
	Salary	91.4	12.5	48.65		124.3
	O & M	45.9	6.3	20.80		73.0
	Capital	12.6	1.7	10.40		24.7
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		2.6	0.36	1.39		4.35
Total Dollar		149.9	20.5	79.85		250.1

* Affiliated C&P Program(s) - 1.3, 4.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
15-86 Prairie Provinces Water Board Monitoring

INDICATORS - A-1-2 a.b.c.d
PRIORITY - Relative Rank 2. Sample Turnaround Time 30 Days

DISSEMINATION OF LABORATORY DATA REPORTS

1 Project Coordinator(s)

2 WESTORE

3 NAQUADAT

4 PPWB. Motherwell Building. Regina. Saskatchewan

5 Director. Water Pollution Control Branch. Saskatchewan Environment

6 M. Morelli. Manitoba DMREM

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Provide finalized data to users within 90 days of collection	ongoing	
2 Verified data for calendar year to be entered on NAQUADAT	March 1	

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
22	South Saskatchewan River at Highway # 41	00AL05AK0001	M
23	Red Deer River near Bindloss	00AL05CK0001	M
24	Beaver River at Beaver Crossing	00AL06AD0001	M
25	Churchill River below Wasawakasik Lake	00SA06EA0003	M
27	Carrot River at Turnberry	00SA05KH0002	M
28	Battle River near Unwin	00SA05FE0001	M
29	Red Deer River near Erwood	00SA05LC0001	M
30	Qu'Appelle River 3.2 Km. South of Welby	00SA05JM0014	M
31	Assiniboine River at Highway # 8 below Kamsack	00SA05MD0002	M
32	Saskatchewan River above Carrot River	00MA05KH0001	M
94	North Saskatchewan River at Lea Park	00AL05EF0001	M

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
315-86 Prairie Provinces Water Board Monitoring

SAMPLING MATRIX

Schema	LAB	Parms	Stns 22,30, 31,32	Stns 23,27, 28,94	Stns 25,29	Stn 24	Total
SA1	F	Phys(F)	M	M	M	M	132
SB1	F	Coliform	M	M	M	M	132
SB3	S	Chlor(F)	M	M	M	M	132
SC1	B	MajorIon	M	M	M	M	132
SC2	S	Phys(L)	M	M	M	M	132
SC4	S	NFR-NFFR	M	M	M	M	132
SD1	S	Nutrients	M	M	M	M	132
SD3	S	P Ortho	M	M	M	M	132
SE1	B	T Metals	M	M	M	M	132
SE2	B	Fe-Mn(Diss)	M	M	M	M	132
SE4	B	Al(Ext)	M	M	M	M	132
SE5	B	Al(Diss)	M	M	M	M	132
SE6	B	Cr(T)	M	M	M	M	132
SE7	B	Hg(T)	M	M	M	M	132
SF1	B	As-Se(F)	M	M	M	M	132
SF2	S	B(F)	M	M	M	M	132
SG1	S	Cn	M	M	M	M	132
SG2	S	Cn(Free)	M	M	M	M	132
SG3	S	Sulfide		V		V	20
SH1	B	Herbs(Old)	M	M	M	M	132
SH2	B	Herbs(New)	M	M	M	M	132
SH3	B	Picloram	M	M	M	M	132
SH4	B	Herbs(Neut)	M	M	M	M	132
SH5	B	OC-PCB	M	M	M	M	132
SH6	B	WOP1WOP2	V	V			64
SH8	S	Phenol	M	M	M	M	132

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
317-86 East Poplar River Bilateral Monitoring Agreement

SUBMITTER - 0001
C&P PROGRAM - 1.1 - Canada-U.S. and Interjurisdictional Waters
DURATION - Ongoing

OBJECTIVES

To provide ongoing surveillance and an annual description of ground water and surface water quality conditions in the East Poplar River Basin near the International Border and to provide support to a Bilateral Monitoring Committee.

RATIONALE

A Bilateral Monitoring Arrangement has been signed by Canada, Saskatchewan, Montana and the U.S.A. Under the terms of the arrangement, Environment Canada is committed to monthly sampling of the East Poplar River, reporting of surface water data, raising and resolving concerns, preparing reports, and reviewing groundwater data. This is done in order to monitor the possible effects on the surface water and ground water regimes of the Saskatchewan Power Corporation mine and generating plant operation near the International Border on the East Poplar River.

DESCRIPTION

Under the terms of the Poplar River Bilateral Monitoring Arrangement, the Branch is committed to: monitoring water quality, maintaining a data base and, upholding other obligations under the Bilateral Agreement.

The resources required for this project have been included in Project 304. Refer to Project 304 for Sampling Matrix and Analytical Requirements for Station No. 7, East Poplar River at International Boundary.

COORDINATOR(S) - Gummer, Crosley, D. McNaughton, NHRI Groundwater Division, NHRC, Saskatoon

RESOURCES

N/A

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
321-86 Analytical Support - Saskatchewan Environment

SUBMITTER - 0428
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Negotiated Annually

OBJECTIVES

To provide analytical support on a full cost recovery basis to Saskatchewan Department of Environment in their program for monitoring and studying toxic substances.

RATIONALE

The WQB (federal government) is committed to federal- provincial cooperation in water resources management programs.

DESCRIPTION

The Branch has a long history of supporting the work of the Government of Saskatchewan. The withdrawal of the Branch from interprovincial monitoring has left a gap which Saskatchewan has attempted to fill. Saskatchewan has limited capability for analyzing for toxic substances, particularly organics. Because of the precedence and because of the federal interest in toxic substances, the Branch has agreed to support the toxic substances program of Saskatchewan by carrying out analysis on a full cost recovery basis. Costs are recovered in accordance with the National Laboratory Cost Schedule and are estimated to be about $15,000 in FY 86/87. An agreement with complete details is on file.

COORDINATOR(S) - J.G. Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.01			0.01
	PY Tech					
	Salary		0.35			0.35
	O & M					
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M	15.00				15.00
	Capital					
PY Total			0.01			0.01
Total Dollars		15.0	0.35			15.35

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
22-86 Analytical Support - Miscellaneous

SUBMITTER - 0459
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES

To provide field and analytical support to pollution surveys as the urgency may require.

RATIONALE

Not all analytical requirements are known in advance. Sampling is sometimes initiated following spills and other pollution events which require laboratory support.

DESCRIPTION

When sampling of pollution events occurs or when unplanned sampling in support of other budgeted projects is conducted, e.g. follow-up pollution verification surveys, the laboratory is contacted regarding its perceived involvement. Work load, sample type, parameter selection, sample turnaround time and reporting requirements are determined in advance of the sample analysis.

COORDINATOR(S) - J.G. Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.01	0.01		0.02
	PY Tech			0.02		0.02
	Salary		0.35	0.90		1.25
	O & M		1.20	1.10		2.30
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.01	0.03		0.04
Total Dollars			1.55	2.00		3.55

323-86 Analytical Support - Other Federal Agencies

SUBMITTER - 0459
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES
To provide field and analytical support to ongoing programs and pollution surveys by other federal agencies as may be required.

RATIONALE
Not all analytical requirments are known in advance. Sampling is sometimes initiated following spills and other pollution events which may require laboratory support. It is Branch policy to provide analytical support to federal agencies but within the restraints of staff and dollars. When necessary, OM costs and salary are recovered.

DESCRIPTION
When sampling of pollution events occurs or when unplanned sampling by other federal agencies is conducted (e.g. follow-up pollution verification surveys) the laboratory may be asked to provide analytical support. Work load, sample type, parameter selection, sample turnaround time and reporting requirements are determined in advance of the sample analysis. Support is also provided to ongoing activities of the federal agencies (CWS, NHRI, NWRI) to assist them in meeting their analytical needs. There is more information regarding support for CWS and NWRI on file.

COORDINATOR(S) - J.G. Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.01		0.01
	PY Tech					0.00
	Salary			0.35		0.35
	O & M			12.20		12.20
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0		0.01		0.01
Total Dollars		0		12.55		12.55

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
30-85 Regional Quality Control Assurance Program

SUBMITTER - 0003
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing since 1984

OBJECTIVES
To continue to evaluate programs, activities and methods in a systematic fashion to enhance the quality of the information provided by the WQB.

RATIONALE
In order to fulfill its mandate, the Branch is committed to producing the best possible data and to fully understanding the limits of this data.

DESCRIPTION
In order to meet their commitment to quality control, the Branch operates several projects. These quality control projects focus on both the field and laboratory stages of data production and are outlined for specific activities in subsequent projects. The Branch, however, recognizes the need for continued dialogue within as well as with experts from outside the Branch and the synthesis of this information in the development of a regional quality assurance program. The quality assurance program is perceived to be evolutionary with the goal in FY 86/87 being to outline the essential elements of a regional quality assurance plan and implement or modify specific aspects of its monitoring and special study activities identified as requiring immediate attention. Emphasis initially will be on inorganic parameters and nutrients followed in subsequent years by toxic organic substances.

COORDINATOR(S) - Chu, Gaskin

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.1		0.1
	PY Tech			0.1		0.1
	Salary			7.5		7.5
	O & M			2.0		2.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.2		0.2
Total Dollars				9.5		9.5

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
331-86 Field Quality Control

SUBMITTER - 0446
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - Ongoing since 1980

OBJECTIVES

(1) Ascribe a degree of precision to the existing sampling method for specific parameters.
(2) Establish criteria on which to review the project design.
(3) Periodically review the project design.
(4) Prepare interpretive reports on an as required basis.

RATIONALE

Knowledge of sampling precision is invaluable to data interpretation. In order that the field quality control project be carried out in the most effective manner possible, a routine procedure for the analysis of data and review of the project design is required.

DESCRIPTION

This project is intended to help ensure consistency in field practices and to quantify the precision of sampling practices. In order to carry this out, replicate samples are collected and analyzed. The results are used to determine analytical variability, calibrate instruments and ensure overall quality control.

COORDINATOR(S) - Chu, Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.01	0.14		0.15
	PY Tech	0.57	0.17	0.03		0.77
	Salary	19.8	6.3	5.95		32.0
	O & M	10.0	3.0			13.0
	Capital	2.7	0.8			3.5
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.57	0.18	0.17		0.92
Total Dollars		32.5	10.1	5.95		48.55

* Affiliated C&P Program(s) - 1.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
32-86 Miscellaneous Field Quality Control

SUBMITTER - 0447
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES

Project allows coding of data not intended to be entered on NAQUADAT.

RATIONALE

Some data generated in certain projects is not wanted on NAQUADAT. As a result, a special project number is required to allow coding for in-house data analysis and to make NAQUADAT entry more streamlined.

DESCRIPTION

This is an "umbrella" project intended to allow coding of miscellaneous samples from various projects, which are not to be stored on NAQUADAT (i.e. distilled water blanks, sample to assess field filtering methods, etc.). Annual reports to file based on the results from the filter blank and rinse water blank samples are required from each of the Resource Officers for samples generated in their programs.

COORDINATOR(S) - B. Chu

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof					
	PY Tech		0.02			0.02
	Salary	0.1	0.70			0.8
	O & M	0.1	0.4			0.5
	Capital		0.2			0.2
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.02			0.02
Total Dollars		0.2	1.3			1.4

333-86 Inter-Regional Quality Control

SUBMITTER - 0444
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES
To ensure the quality and compatibility of laboratory data by participating in the national round-robin quality control programs.

RATIONALE
Quality assurance or quality control ensures that the integrity of the data generated at the laboratory is maintained at a high level of excellence.

DESCRIPTION
The respective National Coordinators for the IRQC/PPWB and LRTAP round robin quality control programs select parameters for investigation and submits appropriate samples to participating laboratories of which the Saskatoon Branch Laboratory is one. A high priority is given to analyzing these samples.

The accuracy and precision of the data generated by the Saskatoon Laboratory is compared by the project coordinators to the known values and to the results from other laboratories. If the examination shows it to be necessary, methodology is changed to improve the quality of the generated data.

COORDINATOR(S) - Chu. Zakrevsky

RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof		0.01			0.01
PY Tech		0.06			0.06
Salary		1.91			1.91
O & M		0.82			0.82
Capital					
Recov. PY Prof					
PY Tech					
Salary					
O & M					
Capital					
PY Total		0.07			0.07
Total Dollars		2.73			2.73

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
334-86 Intra-Laboratory Quality Control

SUBMITTER - 0448
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES
To ensure the quality and compatibility of laboratory data by checking analytical performance of the Inorganic Laboratory through the use of replicates, spikes, blanks, blind unknowns and parameter correlations.

RATIONALE
An adequate Intra-Laboratory QC Program provides a mechanism whereby analytical results are continuously monitored for precision and accuracy and corrective action is immediately taken if results are found to be outside of pre-established control limits.

DESCRIPTION
Duplicate checks must be carried out on a standard solution having a known true value of the parameter of interest, whenever a batch of water samples is to be analyzed. These continuing periodic duplicate checks allow the establishing of x (means) control charts. See the extended description for more detail.

COORDINATOR(S) - Zakrevsky, Gaskin, Chu

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Totals
A Base	PY Prof		1.2	0.01	1.21
	PY Tech		1.3		1.30
	Salary		87.5		87.50
	O & M		2.0		2.00
	Capital				
Recov.	PY Prof				
	PY Tech				
	Salary				
	O & M				
	Capital				
PY Total			2.5	0.01	2.51
Total Dollars			89.5		89.50

335-86 SPECIFIC METHOD EVALUATION - CYANIDE

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - 1986/87

OBJECTIVES

Review the ongoing analysis of the total cyanide parameter in light of the recommendations handed down in the contract Evaluation Report for the Total Cyanide Data Base and Methodology.

RATIONALE

The form of cyanide in water has a direct influence on such considerations as analytical methodalogies, chemodynamics and ecotoxicology. Recent studies have shown that the toxicity of cyanide is independent of the total cyanide concentration. It is primarily due to the concentration of molecular hydrogen cyanide (HCN) in solution.

DESCRIPTION

A total of 11 interprovincial sites are sampled monthly by the WQB for cyanide. These sites represent river systems in both the Canadian Shield and Plains physiographic regions of the WNR.

Cyanide has been shown to be potentially toxic to aquatic organisms, particularly fish. Most fish species find cyanide levels greater than 0.2 mg/L acutely toxic, and concentrations as low as 0.01 mg/L have been reported to cause adverse effects. Therefore, to protect aquatic life, free cyanide levels should not exceed 0.005 mg/L.

An indepth and critical review of the recommendation arising out of the Total Cyanide Evaluation Study may infer that there is a need for the development of an analytical method which could be applied routinely to the measurement of unbounded cyanide (CN) and molecular cyanide (HCN), orginating in surface waters in the WNR.

COORDINATOR(S) - J.E. Gaskin

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.01		0.01
	PY Tech					
	Salary			0.35		0.35
	O & M					
	Capital					
PY Total				0.01		0.01
Total Dollars				0.35		0.35

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87

336-86 Review of Sulfide Methodology

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - 1986/87

OBJECTIVES

1. Review the present ion-selective electrode method with particular reference to its aplicability to the measurement of form(s) of sulfide which is/are hazardous to animal or human life.
2. Evaluate the applicability of at least one alternative method to the determination of harmful form(s) of sulfide.
3. Investigate alternative sample preservation techniques.

RATIONALE

There are a number of concerns with the present methodology:

(i) The method may not be selective enough.
(ii) The detection limit may not be sufficiently low.
(iii) The method used to preserve sulfide in the field results in a laboratory procedure that is tedious, and somewhat unreliable in the low range.

Therefore, there is a need to review our present methodology and investigate alternative approaches.

DESCRIPTION

The Regional Water Quality Laboratory conducts analytical tests for sulfides in surface water samples collected in the winter from four PPWB sites. Sulfide concentrations are generally very low. However, the US-EPA (1976) states that concentrations in excess of 0.002 mg/L constitute a long-term hazard. Therefore, to be adequate, the analytical method must be able to detect levels of 0.001 mg/L or better.

Alternatives to the present ion-selective electrode procedure will be investigated and the most promising ones will be evaluated in our lab. The field preservation procedure will also be reviewed and other approaches will be tried. All findings will be compiled in a report.

COORDINATOR(S) - Zakrevsky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof		0.40			0.40
	PY Tech		0.05	0.03		0.08
	Salary		15.80	1.0		16.80
	O & M		3.00	0.3		3.30
	Capital		5.00			5.00
PY Total			0.45	0.03		0.48
Total Dollars			23.80	1.30		25.10

340-85 International Water Quality Objectives

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES
Initiate and implement negotiations with pertinent officials, with respect to the establishment of water quality objectives at specific transboundary locations.

RATIONALE
Within Western and Northern Region, there is a significant amount of transboundary drainage. For those streams which cross international or territorial borders, the federal government has a clear responsibility to promote the establishment of water quality objectives.

DESCRIPTION
During the year 1986/87, discussions will continue between U.S.A. and Canadian agencies on the establishment of objectives for the Souris River at both transboundary locations. As a result of agreement reached at a January,1986 meeting WQB will be compiling a background document which summarises the existing data base for the entire Souris basin, compares analytical methods for the various agencies which collect data within the basin, list existing objectives/standards for the basin as well as noting the designated uses for each relevant jurisdiction. Field work designed to evaluate dissolved oxygen as an indicator parameter for the two crossings, as well as supplementing the organics data base will be carried out in 1986. See also Project 343.

COORDINATOR(S) - Thomson, Blachford

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.65		0.65
	PY Tech					0.00
	Salary			26.00		26.00
	O & M			7.50		7.50
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.65		0.65
Total Dollars				33.50		33.50

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
341-85 Interprovincial and Federal WQO Promotion and Development

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES

Provide ongoing assistance and advice upon request to WQB-W&NR staff and to promote and assist in the application of water quality objectives for interprovincial waters; and promote and develop water quality management strategies for federal waters.

RATIONALE

Other divisions of WQB, W&NR, other federal agencies as well as provincial governments are involved in activities that may either support or benefit from the support of the Water Quality Objectives Division. Input to these activities is required on a continuing basis from WQO Division in order that maximum, mutual benefit is achieved.

DESCRIPTION

Support and advice, with respect to water quality objectives, will be given to the Branch representative on the PPWB Committee on Water Quality, Branch staff and, where feasible, to individual provinces. Contact will be developed and maintained with other federal agencies with regard to the promotion of water quality objectives.

COORDINATOR(S) - Thomson

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.3		0.3
	PY Tech					
	Salary			12.0		12.0
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.3		0.3
Total Dollars				17.0		17.0

342-85 Water Quality Objectives Evaluation

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES

To review and revise, where necessary, the existing Regional plan for the Water Quality Objectives Division; to maintain knowledge of policy and technical advances; develop and review surveillance monitoring strategies and resultant data for relevant locations.

RATIONALE

In order to maintain orderly and logical operation of the Water Quality Objectives Division as well as contribute to the Long Term Operational Planning process, the Division regional plan must be kept current. One method of doing this is through maintenance of a continual awareness of advances in related technology and policy. This allows an evaluation of current procedures and appropriate revisions. Compliance monitoring is also a form of water quality objectives evaluation. Not only does it serve to evaluate the quality of water it also points out shortfalls in technologic or strategic design, where appropriate revisions should be made.

DESCRIPTION

Based on the findings of meetings with WQB and other government agencies, and a review of relevant literature, the operational plan will be updated. Transboundary streams will be ranked according to their need for objectives.

COORDINATOR(S) - Thomson

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.5		0.5
	PY Tech					
	Salary			20.0		20.0
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.5		0.5
Total Dollars				25.0		25.0

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
343-86 Monitoring and Objectives Evaluation

SUBMITTER - 0003
C&P PROGRAM - 1.1-Interjurisdictional Water Management
DURATION - 1986-87

OBJECTIVES

To test and refine monitoring techniques in order to assess their adequacy when utilized in the development and maintenance of water quality objectives.

RATIONALE

Routine water quality data obtained at sites for which water quality objectives are being considered may be inadequate for that purpose. Water quality constituents may be present which have not previously been detected or have been detected in a manner which does not adequately characterize water quality conditions at that site. The converse may also be true. Therefore reconnaissance monitoring must be taken as part of a station validation exercise. The results of this type of investigation can then be used in the formulation of valid objectives for a particular site. It will also contribute to the development of a suitable surveillance monitoring strategy.

DESCRIPTION

Reconnaissance surveys will be undertaken at five sites where water quality objectives are being considered. For the Souris River emphasis will be placed on evaluation of dissolved oxygen as an indicator parameter for water quality objectives. Major emphasis at the other sites will be on non-target organic scans, to ascertain the validity of the existing data for those sites. Follow-up surveys at these and additional sites is anticipated in future years.

COORDINATOR(S) - Blachford ,Vaughan

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.2		0.2
	PY Tech	0.79	0.05	0.3		1.14
	Salary	27.8	1.7	16.0		45.5
	O & M	13.9	0.8	5.0		19.7
	Capital	3.8	0.2			4.0
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.79	0.05	.5		1.34
Total Dollars		44.5	2.7	21.0		68.2

* Affiliated C&P Program(s) - 1.3

INDICATORS
N/A

PRIORITY
TOP

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinators

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
12	Souris River at Coulter	00MA05NF0001	V
10	Souris River near Glen Ewan	00SA05ND0001	V
49	Slave River at Fitzgerald	00AL07NB0001	V
6	Waterton River at Hwy. 6	00AL05AD0005	V
5	Belly River at Hwy. 6	00AL05AD0060	V

SAMPLING MATRIX

Schema	LAB	Parms	Stns 12	Stn 10	Stn 49	Stn 6	Stn 5	Stn -	Total
SA2	F	Phys(F)	5	5	5	7	4	-	26
SB1	F	Coliform	5	5	5	7	4	-	26
SC1	B	MajorIon	5	5	5	7	4	-	26
SC2	S	Phys(L)	5	5	5	7	4	-	26
SC3	S	NFR	5	5	5	7	4	-	26
SD2	S	Nutrients	5	5	5	7	4	-	26
SE1	B	T Metals	5	5	5	7	4	-	26
SE2	B	Fe-Mn(Dis)	5	5	5	7	4	-	26
SE5	B	Al(Dis)	5	5	5	7	4	-	26
SE6	B	T Cl	5	-	-	-	-	-	5
SE7	B	T Hg	5	5	5	7	4	-	26
SF1	B	As-Se(L)	5	5	5	7	4	-	26
SF2	S	B(L)	5	5	5	7	4	-	26
SG1	S	Cn	5	5	5	7	4	-	26
SH1	B	Herbs(Old)	-	-	-	-	-	1	1
SH2	B	Herbs(new)	-	-	-	-	-	1	1
SH4	B	Herbs(neut)	-	-	-	-	-	1	1
SH5	B	OC-PCB	-	-	-	-	-	1	1
SH6	B	WOP1,WOP2	-	-	-	-	-	1	1
SH8	S	Phenol	5	5	5	7	4	-	26
OTHER:									
	B	Org.Scan (water)	2	2	2	1	1	-	8
	B	Org.Scan (sediment)	2	2	2	-	-	-	6
	B	Org.Scan (fish)	2	2	2	-	-	-	6
	B	Sed (all)	-	-	-	-	-	1	1
	B	Fish (all)	-	-	-	-	-	1	1
	B	Fish (Pic)	-	-	-	-	1	-	1

350-86 Surveys and Interpretation Division Strategic Plan

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES

To identify S & ID's priorities and direction in the context of the Water Quality Branch program and to maintain this strategy on an ongoing basis.

RATIONALE

S & ID consists of a group of disparate technical and professional experts whose responsibilities are divided between providing advice and support to other Branch staff as well as undertaking specialized and multi-disciplinary studies and surveys and providing a liaison with research components of IWD. In order for the Division to fulfill this role effectively it is necessary to identify its working relationships within the Branch and develop a strategy for achieving its goals.

DESCRIPTION

A plan will be prepared for the Division which will identify its priorities, its working relationships within the Branch and develop a strategy for achieving its goals. The Regional EDP Plan, Regional Groundwater Plan, Regional Biomonitoring Plan and other more specific operational plans will identify specific implementation activities of the Division. It will be essential to update this strategic Plan and the operational plans annually.

COORDINATOR(S) - D. Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.05		0.05
	PY Tech					
	Salary			2.25		2.25
	O & M					
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.05		0.05
Total Dollars				2.25		2.25

351-86 Intensive Nutrient Monitoring of Lake Diefenbaker

SUBMITTER - 0007
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Since 1984

OBJECTIVES
To quantify macro-nutrient loadings to and from Lake Diefenbaker.

RATIONALE
It is important to quantify nutrient loadings into and out of Lake Diefenbaker in order to assess trophic state and the need for remedial measures. Current monthly sampling upstream is inadequate for this purpose as is in-lake sampling. Therefore intensive weekly monitoring has been undertaken such that input-output loadings can be determined.

DESCRIPTION
A weekly sample is collected by a lay collector at Lemsford Ferry and shipped directly to the regional lab in Saskatoon. This site is also sampled as part of project 376 and thus cross-sectional information and quality control information is available. Output is sampled at Gardner Dam by SPC personnel on a weekly basis. Quality control samples are also collected here. Weekly sampling is likely adequate although more frequent sampling may be required during high flow periods. Sampling commenced in October 1984 and should continue for at least three years. The data will be reviewed in early FY 86/87 to prepare a preliminary report and to determine the need and frequency of further sampling.

COORDINATOR(S) - Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.02		0.02
	PY Tech		0.22	0.03		0.25
	Salary		7.9	1.80		8.7
	O & M		3.9	2.00		5.9
	Capital		1.1			1.1
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total			0.22	0.05		0.27
Total Dollars			12.9	3.80		16.70

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
351-86 Intensive Nutrient Monitoring of Lake Diefenbaker

INDICATORS - N/A
PRIORITY - 8 weeks

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinator

ACTIVITIES/REPORTING CALENDAR
N/A

STATION LIST

No.	Station location	NAQUADAT no.	Sampling frequency
1	S. Sasktchewan River at Lemsford Ferry	OOSAO5HBOOO1	V
2	L. Diefenbaker at Gardiner Dam	no number	V

SAMPLING MATRIX

Schema	LAB	Parms	Stns 1,2	Total
SC2	S	Phys(L)	W	120
SC3	S	NFR	W	120
SD2	S	Nutrients	W	120
SD3	S	P Ortho	W	120
SD6	S	DN,PN	W	120

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 351 samples	Proj 351 TMU's	Proj 351 Cost
SC2	S	Phys(L)	120		1374.0
SC3	S	NFR	120		1042.8
SD2	S	Nutrients	120		7904.4
SD3	S	P Ortho	120		439.2
SD6	S	DN,DP	120		2085.6
TOTAL	S		600	0	12846.0
G TOTAL			600	0	12846.0

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
360-86 Regional Biomonitoring Program

SUBMITTER - 0489
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES

To develop and initiate a biological monitoring program to assist in assessing aquatic quality within the Western and Northern Region.

RATIONALE

An adequate assessment of aquatic quality is an integrated approach of the chemical, physical and biological sciences. The Branch has undertaken the development of a biological monitoring program to meet this need.

DESCRIPTION

A biological monitoring program is being developed through a search of the scientific literature, contacting and meeting experts in the field, reviewing present WQB biological activities and undertaking pilot studies. The plan will outline the techniques commonly used their application, the pros and cons and will recommend methods for use in this region. The plan will be multi-year in scope and will be reviewed annually.

COORDINATOR(S) - Munro

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.20		0.20
	PY Tech					
	Salary			7.0		7.0
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.20		0.20
Total Dollars				12.0		12.0

* Affiliated C&P Program(s) - 1.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
361-86 Forage Fish Assessment Program

SUBMITTER - 0489
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing - with annual rotation of sampling sites

OBJECTIVES
To collect forage fish samples at various monitoring locations throughout the Region to examine metal and organic compounds in their tissues. Complete report based on the results of the 1984/85 and 1985/86 sampling programs.

RATIONALE
In order to adequately assess the aquatic quality the Branch feels an integrated approach to monitoring is required which examines chemical, physical and biological sciences and multiple media analysis. This project is intented to expand on the media analyzed by the Branch to include biological organisms at selected sites.

DESCRIPTION
The WQB decided in September 1983 to initate a forage fish program to assess the bioaccumulation of pollutants in the aquatic environment. This program was conducted on a limited trail basis during 1984/85. In this Region forage fish were collected at ten sites during the summer of 1984 and analyzed for a number of metals and organic substances, in 1985 additional samples were collected at five sites. A draft report based on the results from these samples was prepared in 1985/86 and will be finalized in 1986/87. Additional sampling will be conducted at a number of other sites in 1986/87.

COORDINATOR(S) - D. Munro

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	TOTALS
A Base	PY Prof			0.15		0.15
	PY Tech	0.17		0.05		0.22
	Salary	5.9		7.0		12.9
	O & M	3.0		3.0		6.0
	Capital	0.8				0.8
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.17		0.2		0.37
Total Dollars		9.7		10.0		19.7

* Affiliated C&P Program(s) - 1.1, 4.1

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
61-86 Forage Fish Assessment Program

INDICATORS - A-1-1 g
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS
D. Munro

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Complete report on results of 1984/85 and 1985/86 sampling programs	June	
2 Collect forage fish samples and prepare samples for analysis	September	
3 Begin preparation of a report based on the results from the 1986/87 samples	March	

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
15	Red River at Emerson	00MA05OC0001	V
12	Souris River at Coulter	00MA05NF0001	V
14	Pembia River at Windygate	00MA05OD0001	V
16	Roseau River at Gardenton	00MA05OD0001	V
20	Winnipeg River at Pointe du Bois	00MA05PF0022	V

361-86 Forage Fish Assessment Program

SAMPLING MATRIX

Schema	LAB	Parms	Stn 12	Stn 14	Stn 15	Stn 16	Stn 20	Total
TE1	B	T Metals	V	V	V	V	V	20
TE2	B	Mo(T)	V	V	V	V	V	20
TE3	B	Hg(T)	V	V	V	V	V	20
TF1	B	As-Se(T)	V	V	V	V	V	20
TH1	B	OC-PCB	V	V	V	V	V	15

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 361 Samples	Proj 361 TMU's	Proj 361 Cost
TE1	B	T Metals (bio)	20	36	1976.4
TE2	B	Mo(T) (bio)	20	6	329.4
TE3	B	Hg(T) (bio)	20	12	658.8
TF1	B	As-Se(T) (bio)	20	20	1098.0
TH1	B	OC-PCB (bio)	15	120	5623.2
TOTAL	B		95	194	9685.8
G TOTAL			95	194	9685.8

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
365-85 Interjurisdictional Ground Water Quality

SUBMITTER - N/A
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES
In accordance with the IWD policy on ground water to be completed in early 1986, to maintain an awareness of ground water issues in the region. It will therefore be necessary to maintain contact with NHRI personnel in Saskatoon, who as of spring 1986, will represent both the operational and research arm of IWD in addressing the ground water issues of Western and Northern Region.

RATIONALE
There are many large aquifers in Western and Northern Region,upon which a large percentage of the population are dependant for water supply. The groundwater resources of the region have been of immense importance to the initial settlement of Western Prairies. There are many areas relating to the Hydrogeology of the region which are of interest to Environment Canada.

(1) Developments in one jurisdiction can affect groundwater quality in another, potentially affecting water use. This could become a major issue in historically water short areas, such as those near the International Border across the breadth of the Western and Northern Region, as well as in the southern interprovincial boundary areas.

(2) The widespread use of chemical herbicides, insectices, and fertilizers on the prairies has caused concern that this huge, non-point source of contamination can or has caused degradation of ground water quality. Since the subject of toxic chemicals is of strong Federal concern, the IWD has attempted to play a larger part in the monitoring and study of the ground water contamination situation in the Region. This has been done to date by means of the PPWB COG, and through joint Federal-Provincial studies, such as the NHRI-SRC Nokomis study, started in late 1985. Further joint studies will be arranged over the ensuing fiscal year.

(3) Heavy oil and tarsand development is becoming an important factor in interjurisdictional aquifer protection in areas of Alberta and Saskatchewan affected by in situ recovery. IWD, NHRI has been involved in this area in previous years, principally as scientific authority to research work carried out by the Alberta Research Council for EPS.

DESCRIPTION
During 1982/83, a groundwater strategy paper was prepared in WNR. This paper gave rise to a number of exchanges between Headquarters and the Region. During 1985/1986, the ground water policy discussions were placed on hold, in anticipation of the final report of the Pearse Enquiry. Due to the relocation ot WQB's Ground Water Quality Specialist to NHRC, it will be necessary in 1986/87 and in ensuing years to maintain closer ties with NHRI and EPS. Contacts will also be maintained with other federal, provincial and international agencies having an interest in regional groundwater

resources.

COORDINATOR(S) - Gummer, Gregor

RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof				0.2	0.2
PY Tech					
Salary				7.0	7.0
O & M					
Capital					
Recov. PY Prof					
PY Tech					
Salary					
O & M					
Capital					
PY Total				0.2	0.4
Total Dollars				7.0	7.0

* Affiliated C&P Program(s) - 1.1.4.2

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
70-86 Evaluation of Toxic Chemicals Program

SUBMITTER - N/A
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES
To prepare a discussion paper which evaluates the present toxic chemicals program and its ability to identify and assess the distribution of toxic chemicals in waters of federal interest and make suggestions for possible change in the program.

RATIONALE
Information on the presence, abundance, distribution, mobility and effects of toxic chemicals is essential towards understanding the risk these chemicals pose to man and the environment. The Branch has monitored for toxic chemicals in water for many years and it is felt that although this monitoring is useful that it could be improved. To that end a discussion paper is to be prepared.

DESCRIPTION
The Water Quality Branch monitoring for toxic chemicals in water has shown that toxic chemicals are not generally found, this has been accepted as an indication that toxic chemicals are not in the aquatic ecosystem. However, recently this assumption has been questioned and its has been suggested that other forms of monitoring might show that toxics are presence. The Branch has conducted numerous pilot studies in recent years to try to assess the potential use of other monitoring techniques for assessing the presence of toxic chemicals in the aquatic ecosystem. A draft discussion paper has been prepared which examines the present monitoring program with suggestion for possible improvement. The discussion paper will be finalized and consideration given to modifying the program.

COORDINATOR(S) - D. Munro, J. Gaskin, H. Vaughan

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.4		0.4
	PY Tech					
	Salary			14.0		14.0
	O & M			5.0		5.0
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.4		0.4
Total Dollars				19.0		19.0

SUBMITTER - 0001
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - 1986 through 1989

OBJECTIVES

1. To initiate a pilot program for enhanced monitoring and assessment of toxic compounds.
2. To complement existing commitments and activities for PPWB, IJC, CCREM, Manitoba Drinking Water Proposal, NWRI, and the WQB objectives.
3. To generate information that can be used to support objectives: e.g., future studies on the assessment of system health over a definable range of conditions.

RATIONALE

The routine water quality monitoring program of WQB mostly consists of the collection and analysis of water samples, for a variety of chemical and biological constituents. Sediments, fish, and macrpphytes are not routinely analyzed. Since sediments, fish and macrophytes are known to concentrate some or many of the toxic chemicals, analysis of these substrates may be more effective in detecting the presence of toxic substances, and in assessing the health of the aquatic environment. The project will be carried out at sites where the routine water quality monitoring is carried out. Data from the routine monitoring will be used in the interpretation of the study results.

DESCRIPTION

Large volume water samples and sediment samples will be collected twice per year in the spring and fall. Water samples will be extracted with an appropriate organic solvent. Bottom sediment, fish, and macrophytes will be collected during the summer. The water samples and sediments will be analyzed for a variety of metals and organics as shown below. Fish and macrophytes also will be analyzed for metals and organics. Water extracts, sediments and macrphytes will be analyzed at the National Laboratory in Burlington. Tests for toxicity screening will be conducted, for water extracts and sediments, at the University of Manitoba, and by NWRI in Burlington.

COORDINATOR(S) - Chacko

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
71-86 Enhancement of Water Quality Monitoring

RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof			0.25		0.25
PY Tech	0.77		0.25		1.02
Salary	27.5		17.5		45.0
O & M	13.8		5.0		18.8
Capital	3.8		*		3.8
Contractual work:					
U of M			4.9		4.9
NWRI			4.90		4.9
Follow-up exploratory analyses			2.20		2.2
PY Total	0.77		0.50		1.27
Total Dollars	45.1		29.5		64.6

* Costs for suspended sediment samples and in situ organic extractor are not included

AFFILIATED C&P PROGRAM(S) - 1.3

INDICATORS - N/A
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinators

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1	1986/87	Carry out pilot study at Red, Souris, and Assiniboine Rivers
2	1987/88	Initial reporting of the first year results; undertake study at three more sites (continuation of some sites from first year may be appropriate)
3	1988/89	Review and alter the project as required. Update the report, based upon results from the second year. Undertake study at the remaining three sites. Compile data and decide on the report format.

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
12	Souris River at Coulter	00MA05NF0009	see above
14	Pembina River at Windygates	00MA05OB0001	see above
15	Red River at Emerson	00MA05OC0001	see above
16	Roseau R. at Gardenton	00MA05OD0001	see above
19	Pipestone Creek at Cromer	00MA05NG0013	see above
20	Winnipeg River near Pt. du Bois	00MA05PF0022	see above
30	Qu' Appelle River near Welby	00SA05JM0014	see above
31	Assiniboine R. at Kamsack	00SA05MD0002	see above
32	Sskatchewan R. above Carrot R.	00MA05KH0001	see above

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
371-86 Enhancement of Water Quality Monitoring

SAMPLING MATRIX

Schema	LAB	Parms	Stn 12	Stn 15	Stn 31	Total
SE5	B	Al-diss	SA	SA	SA	8
SF3	B	As-Se (L)	SA	SA	SA	31
SE1	B	T Metals	SA	SA	SA	31
SE2	B	Fe-Mn (D)	SA	SA	SA	8
SE6	B	Cr (T)	SA	SA	SA	31
SE7	B	Hg (T)	SA	SA	SA	31
SH1	B	Herbs	SA	SA	SA	8
SH2	B	Herbs	SA	SA	SA	8
SH4	B	Herbs	SA	SA	SA	8
SH6	B	Organo-P	SA	SA	SA	8
RH1	B	OC/PCB (sed)	SA	SA	SA	8
TH1	B	OC/PCB (tiss)	A	A	A	62
RE2	B	Hg (seds)	SA	SA	SA	62
RF1	B	As (seds)	SA	SA	SA	62
RE1	B	Metals (seds)	SA	SA	SA	62
TE1	B	Metals (tiss)	A	A	A	62
TE3	B	Hg (tiss)	A	A	A	62

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 371 Samples	Proj 371 TMU's	Proj 371 Costs
SE1	B	T Metals	31	26.04	1429.72
SE2	B	Fe-Mn(Diss)	8	0.32	17.60
SE5	B	Al(Diss)	8	0.16	8.80
SE6	B	Cr(T)	31	9.30	510.57
SE7	B	Hg(T)	31	2.48	136.40
SF3	B	As-Se(L)	31	9.30	510.57
SH1	B	Herbs(Old)	8	40.00	1874.40
SH2	B	Herbs(New)	8	40.00	1874.40
SH4	B	Herbs(Neut)	8	40.00	1874.40
SH6	B	WOP1WOP2	8	48.80	2286.80
RE1	B	T Metals (sed)	62	223.20	12253.68
RE2	B	Hg (T) (sed)	62	37.20	2042.28
RF1	B	As-Se(T) (sed)	62	111.60	6126.84
RH1	B	OC-PCB (sed)	8	64.00	2999.04
TE1	B	T Metals (bio)	62	111.60	6126.84
TE3	B	Hg(T) (bio)	62	37.20	2042.28
TH1	B	OC-PCB (bio)	8	64.00	2999.04
TOTAL	B		498	865.20	45113.66
G TOTAL			498	865.20	45113.66

372-86 Aquatic Quality Survey of the Northwest Territories

SUBMITTER - 0001
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing since 1985/86

OBJECTIVES

To determine the fate, specifically the historical trend and current levels, and assess the significance to aquatic quality, of anthropogenic contamination of the Arctic and Sub-arctic aquatic environment, resulting from the long-range transport and subsequent depostion of aerosol contaminants.

RATIONALE

Toxic substances have been detected in fish and seals in the Arctic, at levels high enough to cause concern. The source of these toxics is poorly understood. WQB wishes to establish the significance of atmospheric deposition to the surface waters, through an aquatic quality survey of selected waters.

DESCRIPTION

This description is a summary only. More detailed information is available from the project coordinator. See also project 37-86 - Toxic Substance Survey of Snow in the Northwest Territories

The long range transport of pollutants, such as associated with the Arctic haze phenomenon, is believed to be contributing measurable quantities of xenobiotics to the aquatic environment on northern Canada. The health of these waters and the dependent biological community is likely to be degraded if these loadings continue. However, the overall sensitivity of these waters and indeed even the basic chemistry is an unknown. This research will "set the clock" with respect to the level of anthropogenic contanimants in the surface waters of the north by investigating the sediment record of selected lakes. This research will also determine aquatic quality of surface waters with respect to anthopogenically derived toxic metals and organic compounds as well as evaluating the importance of the atmospphere as a "source" though annual snow surveys and an ice cap survey.

The environmental significance of the measured contaminants levels will be assessed through the application of bioassessment techniques appropriate to the natural characteristics of this environment. Synthesis of this information will assist in determining the level and impact to date of deposition of toxic substances in the north, as well as providing significant direction for aquatic quality monitoring programs and research activities of environmental agencies.

COORDINATOR(S) - Gregor

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
372-86 Aquatic Quality Survey of the Northwest Territories

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.5		0.5
	PY Tech	0.3	0.15	0.1		0.55
	Salary	10.3	5.2	21.0		26.5
	O & M	5.2	2.6	54.4		62.2
	Capital	1.4	0.7	5.0		7.1
Recov.	PY Prof					
	PY Tech					
	Salary	(recovery is unknown at this time)				
	O & M					
	Capital					
PY Total		0.3	0.15	0.15		1.05
Total Dollars		16.9	8.5	10.80		36.2

* Affiliated C&P Program(s) - 4.2

372-86 Aquatic Quality Survey of the Northwest Territories

INDICATORS - A-2-1-a
PRIORITY - 12-weeks

DISSEMINATION OF LABORATORY DATA REPORTS
Project Coordinator

ACTIVITIES/REPORTING CALENDAR
See study outline above

STATION LIST
Stations are not defined as yet.

SAMPLING MATRIX

Schema	LAB	Parms	Stn	Stn	Total
SA1	F	Phys(F)	28	36	64
SA2	F	Phys(F)	28	36	64
SA3	F	Phys(F)	28	36	64
SA4	F	Phys(F)	28	36	64
SC1	B	MajorIon	28	36	64
SC2	S	Phys(L)	28	36	64
SC3	S	NFR	28	36	64
SD1	S	Nutrients	28	36	64
SD3	S	P Ortho	28	36	64
SD6	S	DN, PN	28	36	64
SE1	B	T Metals	28	36	64
SE3	B	Fe-Mn(Ext)	28	36	64
SE4	B	Al (Ext)	28	36	64
SE7	B	Hg(T)	28	36	64
SF1	B	As-Se(F)	28	36	64
SH2	B	Herbs(New)	?	?	15
SH4	B	Herbs(Neut)	?	?	15
SH5	B	OC-PCB	?	?	15
-	B	Arochlor 1254	?	?	15
-	B	Arochlor 1260	?	?	15
-	B	12 PNA's	?	?	15
SEDIMENT SAMPLES					
-	B	Arochlor 1254	?	?	15
-	B	Arochlor 1260	?	?	15
-	B	12 PNA's	?	?	15
BIOLOGICAL SAMPLES					
-	B	Arochlor 1254	?	?	15
-	B	Arochlor 1260	?	?	15
-	B	12 PNA's	?	?	15

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
74-86 Research Liaison and Technology Transfer

SUBMITTER - 0007
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES

To enhance the activities and capabilities of the Branch and its personnel through liaison with IWD research agencies (NWRI and NHRI) as well as other agencies; and, to develop and/or adapt new technologies to the Branch measurement and assessment techniques.

RATIONALE

The science of environmental quality measurement and assessment is rapidly evolving. Liaison with other water quality experts and researchers is mandatory if the Branch is to keep pace with this evolution. This will be achieved through cooperative efforts between the Branch and research scientists and other personnel for the purpose of exchanging ideas, expertise and developing or adapting new technology.

DESCRIPTION

See also Projects 360,365,375,376 and 379.

1. Ongoing meetings with NWRI and NHRI staff in Burlington and Saskatoon regarding sampling and analysis of toxic substances;
2. Joint undertakings with GLFRB, DF&O to bioassess metals and other toxic substances in selected sediment samples;
3. Coordination with regional and national labs regarding data and methods;
4. Field testing and evaluation of a field liquid/liquid organic extraction system developed jointly by WQB and NWRI.

COORDINATOR(S) - Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.10		0.10
	PY Tech	0.15	0.02	0.05		0.22
	Salary	5.2	0.7	5.25		11.15
	O & M	2.6	0.3	8.50		11.40
	Capital	0.7	0.1	1.00		1.80
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.15	0.2	0.15		0.32
Total Dollars		8.5	1.1	14.75		24.35

INDICATORS - C-1-1-c; C-1-1-e; B-1-1-d
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS

D. Gregor

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Receive modified extractor from Burlington	April	
2 Undertake field testing	Ongoing to March 31	
3 Prepare evaluation report	March 31	
4 Participate in research coordination activities	Ongoing	
5 Attend field/lab coordinating meetings	Ongoing	

SAMPLING MATRIX

Schema	Lab	Parms	Total
SA1	F	Phys(F)	10
SC1	B	Majorion	10
SC3	S	NFR	10
SC2	S	Phys(L)	10
SD1	S	Nutrients	10
SD3	S	P Ortho	10
SD4	S	DIC	10
SD6	S	DN,PN	10
SE1	B	T Metals	10
SH2	B	Herbs(new)	10
SH4	B	Herbs(neut)	10
SH5	B	OC-PCB	10
SH7	B	WOP1	10

* Note: Stations are not yet identified for this project.

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
375-86 Specimen Banking

SUBMITTER - 0489
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - Ongoing

OBJECTIVES

To establish and maintain a regional specimen bank for sediment, biological, and water samples. Establish procedures for collecting, treating, and storing sediments.

RATIONALE

The establishment of a specimen bank will allow for the timely collection of samples from various field program , which can be stored for analysis at a latter date; thereby, reducing costs in the field and laboratory. In addition specimen banking could create a source of samples for possible retrospective analysis.

DESCRIPTION

Initially this project will consist of a review of available literature on the subject of sample storage including collection methods, splitting and preservation method and storage containers required for the various forseeable analysis. Also included in the initial stages of this project will be the establishment of a procedure for recording and cataloguing of samples placed in the specimen bank. During FY 86/87, special studies will be undertaken to contribute samples to the bank as well as to provide time of collection analyses.

COORDINATOR(S) - Munro, Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.10		0.10
	PY Tech					
	Salary			3.50		
	O & M			2.00		
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.10		
Total Dollars				5.50		

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
378-86 Aquatic Sensitivity to Acid Rain - Mapping

SUBMITTER - 0003
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - 1984/85 to 1986/87

OBJECTIVES

(1) To compile and map the available data for the NWT for aquatic sensitivity to acid rain in accordance with guidelines established by the Western Canada LRTAP Committee. (2) To provide assistance and coordination to the provinces of Manitoba, and Saskatchewan in their mapping. (3) Identify sensitive or potentially sensitive areas requiring further data collection.

RATIONALE

The Western Canada LRTAP Committee has recommended that all of Western Canada should be mapped. WQB is providing support for the NWT through computerized isochronal mapping capabilities. In order to ensure that the maps for all three areas are comparable, WQB is providing mapping assistance and overall coordination.

DESCRIPTION

NAQUADAT data and other water quality data available for the last 10 years for the NWT have been screened for suitability within this excercise. Stations on large river systems and lakes which receive drainage from heterogeneous soil types and rock parent materials were excluded. The remaining stations will be used in the preparation of isochronal maps for pH, Ca, Mg, Alk and Al, which together with the terrestrial sensitivity maps should outline sensitive areas and/or areas requiring more data. This information will be compiled with that of other provinces to prepare a map for Western Canada. The results for NWT will be presented as a joint report with the GNWT.

COORDINATOR(S) - D. Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.05		0.05
	PY Tech			0.10		0.10
	Salary			5.25		5.25
	O & M			3.00		3.00
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.15		0.15
Total Dollars				8.25		8.25

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
79-86 LRTAP Monitoring and Special Studies

SUBMITTER - 0007
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing since 1984

OBJECTIVES
To undertake, cooperate in, or advise on special surveys, monitoring programs and reporting of the measurement and assessment of surface water quality as affected by LRTAP and to provide advice to the Western LRTAP Committee as required.

RATIONALE
LRTAP is a growing issue in Western Canada. WQB must be in a position to contribute to regional efforts directed at these concerns.

DESCRIPTION
A number of specific and general activities are undertaken by the Branch in order to address regional LRTAP issues. These are undertaken under the Toxic Chemicals Program in order to cover both acid rain and toxic substances. The activities are as follows:

1. Assist NWRI in sampling for organic compounds in precipitation at selected sites within the region
2. Provide input to national and regional LRTAP committees
3. In cooperation with Saskatchewan Environment, undertake an intensive sampling program in the Cree Lake area in conjunction with the sampling undertaken in Project 312
4. Assist Province of Manitoba with analyses of water samples from acid sensitive lakes sampled by Manitoba Department of Energy, Mines and Resources.

It must be noted however, that items 3 and 4 above are subject to receiving funds from the IWD-LRTAP Program.

COORDINATOR(S) - Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.1		0.1
	PY Tech	0.11		0.15		0.26
	Salary	3.9		8.7		12.6
	O & M	1.9		2.0		3.9
	Capital	0.5		2.0		2.5
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M			28.8		28.8
	Capital					
PY Total		0.11		0.25		0.36
Total Dollars		6.3		41.5		47.8

INDICATORS - A-2-1-c
PRIORITY - 16 weeks Turnaround

DISSEMINATION OF LABORATORY DATA REPORTS
Coordinator

ACTIVITIES/REPORTING CALENDAR
There will be six to nine lakes sampled about six times per year.

STATION LIST
Stations are not assigned as yet.

SAMPLING MATRIX

Schema	LAB	Parms	Stns	Total
SEDIMENT SAMPLES				
RE1	see above	T Metals	?	9
RE2	see above	Hg(T)	?	9
RF1	see above	As-Se(T)	?	9
RH1	see above	OC-PCB	?	9

Note: all water chemistry for the Saskatchewan portion of the study will be analyzed the SRC in order to be comparable to SDOE data. Manitoba samples will be analyzed by a Manitoba laboratory, on a cost-shared basis.

SAMPLING MATRIX

Schema	LAB	Parms	Proj 379 Samples	Proj 379 TMU's	Proj 379 Cost
RE1	B	T Metals (sed)	9	32.4	1778.76
RE2	B	Hg (T) (sed)	9	5.4	296.46
RF1	B	As-Se(T) (sed)	9	16.2	889.38
RH1	B	OC-PCB (sed)	9	72.0	3373.92
TOTAL	B		36	126.0	6338.52
G TOTAL			36	126.0	6338.52

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
80-86 Toxic Substance Survey of Snow in the Northwest Territories

SUBMITTER - 0007
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - Ongoing since 1985

OBJECTIVES
1. Collect large-volume snow samples from an estimated 20 sites widely distributed about the Keewatin and Franklin Districts, to provide a spatial pattern of snow chemistry.
2. Undertake snow pit sampling of approximately five-year aggregations to assess the temporal pattern of toxic chemical loadings over the last 50 years.

RATIONALE
The transport of aerosol associated contaminants occurs dominantly during the winter, due to the southward movement of the polar front and the associated circulation patterns. A substantial proportion of the precipitation in the north comes as snow. The general range is 50 to 90% as snow for the eastern and high Arctic areas and as little as 30 % in the western NWT. For this reason, the eastern Arctic is to be emphasized in this study. Due to the atmospheric circulation patterns and the proportion of total precipitation falling as snow, it is reasonable to undertake a snow chemistry survey, to estimate the significance of this pathway to the loading of toxic substances to the northern aquatic environment.

DESCRIPTION
The increasing weight of information on the presence of toxic substances in Arctic biota (e.g. seals and polar bears) warrants an assessment of pathways. This proposal is an effective means of collecting relevant information to provide a first approximation of the importance of atmospheric deposition to the toxic substance load to the northern aquatic system. The snow chemistry work outlined here is directly related to a toxic chemical study of fresh water aquatic systems (including water, sediment, and biota) in the central Keewatin. Preliminary work was initiated during the summer of 1985 and will continue in 1986 as part of a a WQB, WNR undertaking.

COORDINATOR(S) - Gregor

RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof			0.3		0.3
PY Tech	0.33	0.03			0.36
Salary	11.6	1.1	10.5		23.2
O & M	5.8	0.1	15.8		21.7
Capital	1.6				1.6
PY Total	0.33	0.03	0.3		0.66
Total Dollars	19.0	1.2	26.3		46.5

SAMPLING MATRIX

Schema	LAB	Parms	Total
SA1	F	Phys(F)	33
SC1	B	MajorIon	33
SC2	S	Phys(L)	33
SPECIAL ANALYSES (WATER)			
WCB		WCB-Chlorobenzenes	33
Misc.b		Toxaphene, PNA's,OC's, and PCB's (precip.)	33
Misc.c		Trace metals (with 10-fold concentration by evaporation)	33

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 380 Samples	Proj 380 TMU's	Proj 380 Costs
SA1	F	Phys(F)	33		
SC1	B	MajorIon	33	30.36	1552.65
SC2	S	Phys(L)	33		377.85
Misc.b	B	Toxaphene etc	33		9900.00
misc.c	B	10X Metals	33		2310.00
WCB	B	Chlorobenzenes	33	112.20	5257.56
TOTAL	S		33	0.00	377.85
TOTAL	B		132	142.56	19020.21
G TOTAL			198	142.56	19398.06

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
3010-85 Evaluation of Sampling Methods

SUBMITTER - 0494
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - April 1980 to March 1986

OBJECTIVES

To compare the results obtained using present Branch sampling techniques to those obtained using the equal discharge increment method.

RATIONALE

Metals, nutrients and organics are important in Branch programs and may be influenced by the presence of suspended sediment. Since the present sampling techniques were not designed to collect representative suspended sediment samples, the technique needs to be evaluated.

DESCRIPTION

An accepted procedure for collecting suspended sediment is the equal discharge increment (EDI) method. For this study, the EDI method will be compared to present Branch methods. The field work for the study was carried out in FY 80/81. During 84/85 the interpretation of the data was undertaken and a draft of the report was completed. During 85/86 the final report will be completed and a paper will be presented at a workshop on interpretation methods.

COORDINATOR(S) - Block, Gregor

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	TOTALS
A Base	PY Prof			0.09		0.09
	PY Tech			0.05		0.05
	Salary			5.00		5.00
	O & M			2.00		2.00
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.14		0.14
Total Dollars				7.00		7.00

* Affiliated C&P Program(s) - 1.1, 4.1

3011-86 Red River Automonitor Data Review

SUBMITTER - 0003
ECS PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - 1984/85

OBJECTIVES

To prepare a draft report on the historical automonitor data collectd from the Red River at Emerson Manitoba.

RATIONALE

Under International Joint Commission (IJC) directives, the Water Quality Branch operates a continuous water quality monitor on the Red River at Emerson. Along with the continuous monitor data, monthly samples are collected. After 14 years, a large data base is available and the assessment of these data is a priority of the Branch.

DESCRIPTION

Since 1971, the Branch has operated a continuous monitor at Emerson, Manitoba. Parameters measured are: DO, pH, conductivity, chlorides and temperature. With very few exceptions, the monitor has operated on a continuous basis; acquiring more than 95% of the intended data base. This data base is not only useful in evaluating IJC objectives but is valuable in assessing the water quality of the Red River during this period. Therefore, an evaluation and assessment of the data was prepared for March 31, 1986. After internal comment,a completed draft will be prepared for June 1 1986 with a final draft ready for external review scheduled for Oct 31 1986.

COORDINATOR(S) - V. Chacko

RESOURCES

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof			0.22		0.22
PY Tech					
Salary			9.00		9.00
O & M			4.00		4.00
Capital					
Recov. PY Prof					
PY Tech					
Salary					
O & M					
Capital					
PY Total			0.22		0.22
Total Dollars			13.00		13.00

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
014-86 Development of a Biological Data Storage System

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - ongoing

OBJECTIVES

To develop a computerized data storage system and procedure for storing data generated from biological studies conducted by the Water Quality Branch in the Region.

RATIONALE

The Water Quality Branch in the Western and Northern Region believes that all the data generated in the Region should be electronically stored. With the increasing emphasis being placed on biological monitoring in the Region, an increasing volume of biological data is being generated. This data does not lend itself to computerized storage by the methods presently in use for storage of water chemistry data, therefore a storage procedure for biological data must be developed.

DESCRIPTION

There are three steps in the development of the facility to store biological information. The first is the preparation of a parameter code dictionary. The second is the development of a data entry procedure since existing software is inadequate. The final step is documenting the facility for use. Much on this work has being done in the Atlantic Region in the development of NABIODAT. The use of NABIODAT in the Western and Northern Region will be examined.

COORDINATOR(S) - D. Munro, R. Schimnosky

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.08		0.08
	PY Tech					
	Salary			2.75		2.75
	O & M			1.00		1.00
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.08		0.08
Total Dollars				3.75		3.75

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
3015-86 Water Quality Data Reports

SUBMITTER - 0003
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing

OBJECTIVES
To publish detailed water quality data reports for Alberta, Saskatchewan, Manitoba and the Northwest Territories.

RATIONALE
Data from Branch monitoring measurement and assessment programs should be made readily available to data users, including the public, the scientific community and other government agencies.

DESCRIPTION
Data from monitoring, measurement and assessment programs are verified and stored on NAQUADAT. These data are published on an annual basis in provincial and territorial data reports.

COORDINATOR(S) - Block (Alta & NWT), Crosley (Sask), Chacko (Man)

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.25		0.25
	PY Tech					
	Salary			8.8		8.8
	O & M			12.5		12.5
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				.25		.25
Total Dollars				21.3		21.3

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
3016-86 Effects of Irrigation Return Flow on Ground Water Quality

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data: 4.2 - Toxic Chemicals
DURATION - August 1983 to April, 1986

OBJECTIVES

To investigate, in the Western Canada context, the overall issue of irrigation return flow, and its effect on groundwater quality.

RATIONALE

Increased irrigation on the Prairies has given rise to problems with salination of ground water, as well as contamination of unconfined aquifers with pesticide residues, nitrate/nitrite, and other contaminants. The report is a discussion of the subject. The data for the report were obtained by means of a literature review carried out 1983/1984 by the Objectives Division, WQB.

DESCRIPTION

Principal authors : K Thomson, D.A. Neufeld, D.C. McNaughton

COORDINATOR(S) - D. McNaughton

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.10	0.1	0.2
	PY Tech					
	Salary			3.5	3.5	7.0
	O & M					
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.1	0.1	0.2
Total Dollars				3.5	3.5	7.0

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
3376-86 South Saskatchewan R. and L. Diefenbaker Study: Reporting Phase

SUBMITTER - 0003
C&P PROGRAM - 4.1 - Toxic Chemicals
DURATION - 1984/85 to 1986/87

OBJECTIVES

(1) To describe the temporal and spatial water chemistry characteristics of Lake Diefenbaker and the South Saskatchewan and Red Deer Rivers above and below their confluence. (2) To quantify the contaminant burden of the resident biota. (3) To synthesize this and other available information in a comprehensive report.

RATIONALE

Lake Diefenbaker is a high priority of the Province of Saskatchewan because of the need to protect the lake as a supply of drinking and irrigation water and as a recreational reservoir. Current priorities require that an extensive short duration study be undertaken in order to assist with pending management discussions. This study will also be used to determine the need for a longer intensive study or monitoring program and/or identify research needs within the basin.

DESCRIPTION

Due to the many facets of this study, a summarized description has not been provided. A study plan which also shows the work sharing program between WQB and SDOE is available from the project coordinator. All field work was completedin FY 85/86. Reports on nutrients and trophic state, metals and major ions, and toxicity screenings will be completed this year. The integrated report complete with the toxic substance chemistry report will not be available until FY 87/88.

COORDINATOR(S) - D. Gregor, D. Munro

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	TOTALS
A Base	PY Prof			0.2		0.2
	PY Tech			0.0		0.0
	Salary			7.0		7.0
	O & M			20.0		20.0
	Capital			0.0		0.0
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.2		0.2
Total Dollars				27.0		27.0

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
3098-86 Electronic Data Processing Coordination

SUBMITTER - N/A
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - Ongoing since 1980

OBJECTIVES

To coordinate EDP activities within the Branch to ensure the orderly implementation and operation of EDP facilities.

RATIONALE

The Western and Northern Region Water Quality Branch is expanding its use of electronic data processing to enhance its data management and interpretation capabilities. In order to coordinate these activities, and attempt to see that the Branch EDP resources are used effectively, this project has been established.

DESCRIPTION

This project covers those electronic data processing (EDP) activities which are not project specific. The operation, maintenance, development and management of the Branch's EDP resources are overhead activities in that they benefit all projects which use EDP resources. The PY's shown in the Resources table include .4 term PY required to complete planned software development.

COORDINATOR - R.P. Schimnosky

RESOURCES ($ 000.)

Category	Nat Lab	Reg Lab	Field	Admin.	Totals
A Base PY Prof			1.4		1.4
PY Tech					0
Salary			49		49
O & M			90		90
Capital			60		60
Recov. PY Prof					
PY Tech					0.0
Salary					0.0
O & M					
Capital					
PY Total			1.4		1.4
Total Dollars			199		199

* Affiliated C&P Program(s) - 1.1, 4.1

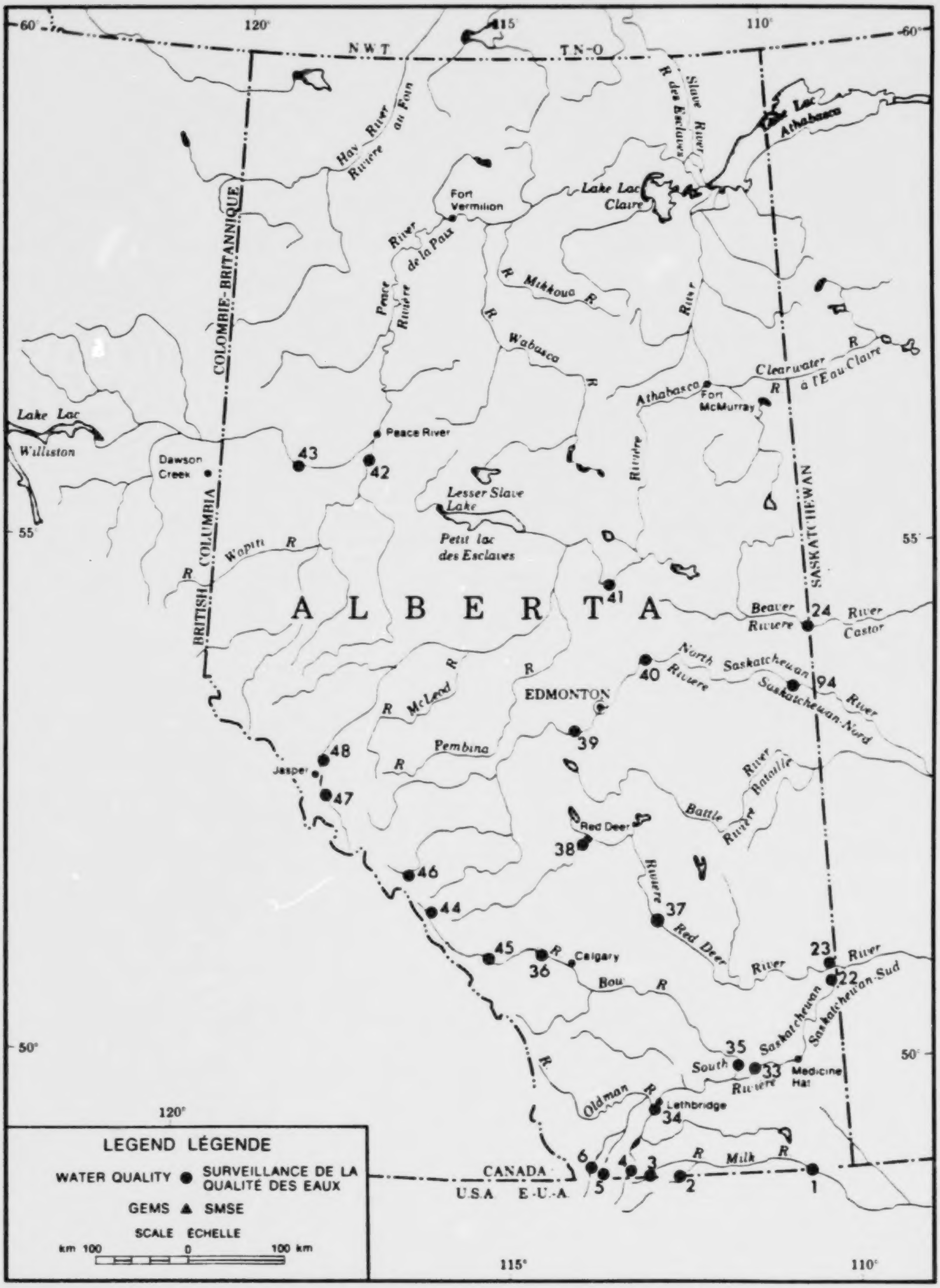
60°
120°
115°
110°
60°
N.W.T.
T.N.-O.
Hay River
Rivière au Foin
Slave River
R. des Esclaves
Lake Lac Athabasca
Lake Lac Claire
Fort Vermilion
Peace River
Rivière de la Paix
R. Mikkoua R.
R. Wabasca R.
River
COLOMBIE-BRITANNIQUE
BRITISH COLUMBIA
SASKATCHEWAN
Athabasca
Rivière
Fort McMurray
Clearwater R.
à l'Eau Claire
Lake Lac Williston
Dawson Creek
Peace River
43
42
Lesser Slave Lake
Petit lac des Esclaves
55°
55°
R. Wapiti R.
ALBERTA
41
Beaver River
Rivière Castor
24
North Saskatchewan River
Rivière Saskatchewan-Nord
40
94
EDMONTON
R. McLeod R.
R.
Pembina R.
39
48
Jasper
47
Battle River
Rivière Bataille
Red Deer
38
46
Rivière Red Deer River
37
44
45
36
R.
Calgary
Bow R.
23
River
22
South Saskatchewan River
Rivière Saskatchewan-Sud
50°
50°
35
33
Medicine Hat
R.
Oldman R.
Lethbridge
34
120°
Milk R.
R.
CANADA
U.S.A.
E.-U.-A.
6
5
4
3
2
1
LEGEND LÉGENDE
WATER QUALITY ● SURVEILLANCE DE LA QUALITÉ DES EAUX
GEMS ▲ SMSE
SCALE ÉCHELLE
km 100 0 100 km
115°
110°

FIGURE 15 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

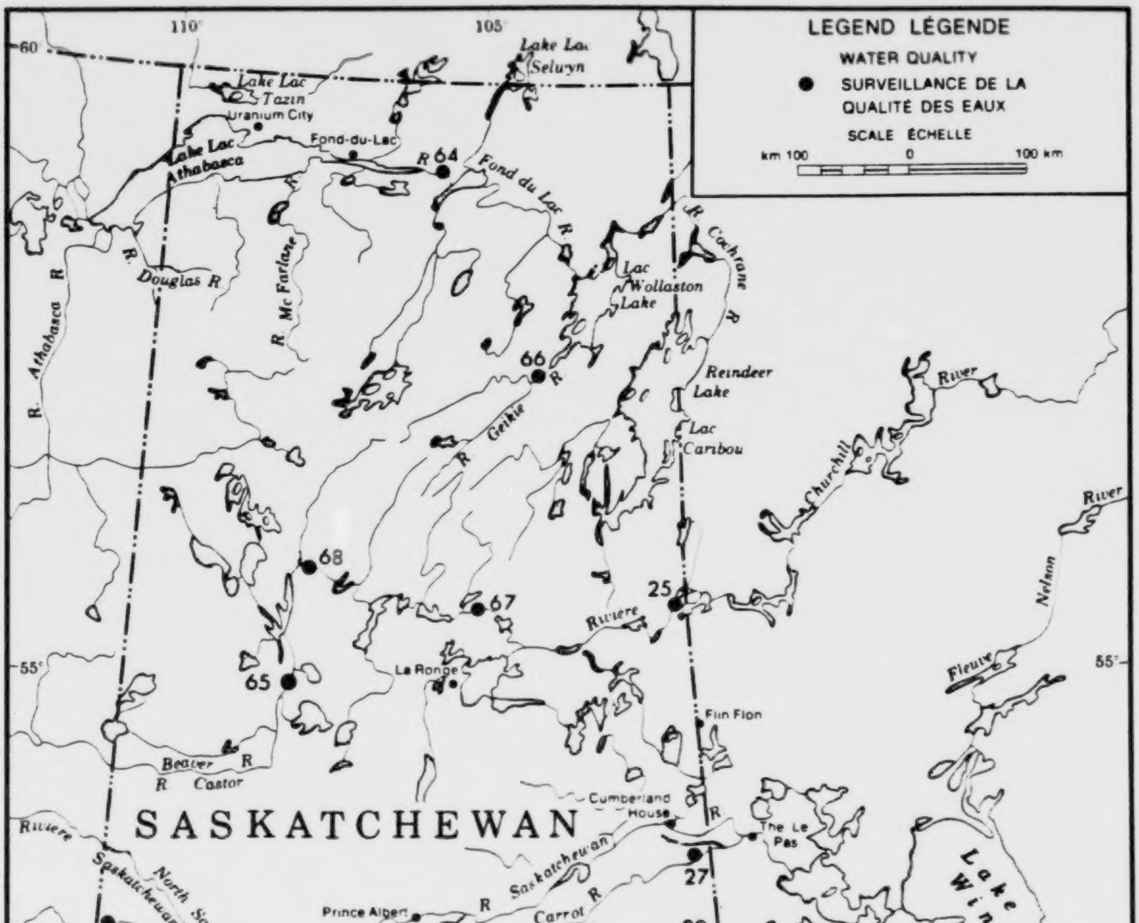
LEGEND LÉGENDE
● WATER QUALITY SURVEILLANCE DE LA QUALITÉ DES EAUX
SCALE ÉCHELLE
km 100
0
100 km
110°
105°
100°
60°
55°
50°
Lake Lac Tazin
Uranium City
Lake Lac Athabasca
Fond-du-Lac
64
Fond du Lac R
Lake Lac Selwyn
R. Douglas R
R. Mc Farlane
R. Athabasca R.
Lac Wollaston Lake
R. Cochrane R
66
Reindeer Lake
Lac Caribou
R Geikie
Churchill
River
Nelson
Fleuve
River
68
67
25
Riviere
65
La Ronge
Flin Flon
Beaver R
R Castor
Cumberland House
R
The Le Pas
SASKATCHEWAN
Riviere
Saskatchewan Nord
North Saskatchewan
River
Saskatchewan R
27
Lake Lac Winnipeg
28
Prince Albert
Carrot R
R Carotte
29
Red Deer R
North Battleford
ALBERTA
MANITOBA
Lac Lake Winnipegosis
Biggar
Saskatoon
Wynyard
Riviere
Kamsack
River
95
31
South
96
Saskatchewan Sud
Saskatchewan
Riviere
Lake Lac Manitoba
R Rouge
30
Assiniboine
R
Qu' Appelle R
Moose Jaw
REGINA
Red R
River
WINNIPEG
R
Souris
R.
Frenchman
54
52
53
7
CANADA
8
Estevan
9
10
U.S.A. E.-U.-A.
R. Milk R
Poplar R
R

FIGURE 16 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

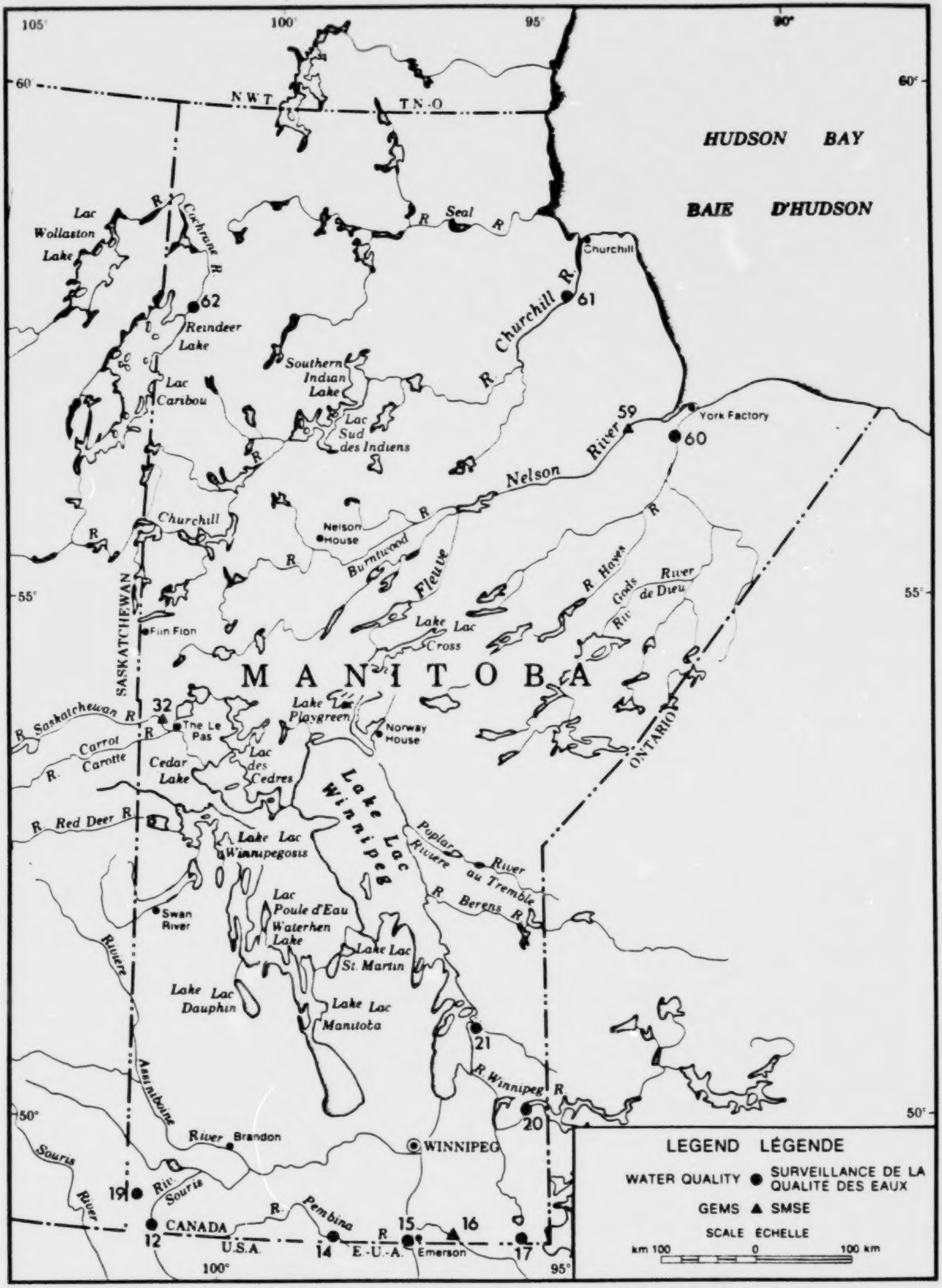
105°
100°
95°
90°
60°
60°
55°
55°
50°
50°
100°
95°
N W T
T.N.-O.
HUDSON BAY
BAIE D'HUDSON
Lac Wollaston Lake
Cochrane R.
R.
Seal R.
R.
Churchill
62
Reindeer Lake
Lac Caribou
Southern Indian Lake
Lac Sud des Indiens
R. Churchill R.
61
59
60
York Factory
Nelson River
R.
Churchill R.
Nelson House
Burntwood R.
R.
Fleuve
R. Hayes
Gods River
Riv. de Dieu
SASKATCHEWAN
Flin Flon
Lake Lac Cross
MANITOBA
32
R. Saskatchewan R.
The Le Pas
Carrot R. Carotte
Cedar Lake
Lac des Cedres
Lake Lac Playgreen
Norway House
ONTARIO
Lake Lac Winnipeg
R. Red Deer R.
Lake Lac Winnipegosis
Poplar River
Riviere au Tremble
R. Berens R.
Swan River
Riviere
Lac Poule d'Eau
Waterhen Lake
Lake Lac St. Martin
Lake Lac Dauphin
Lake Lac Manitoba
21
R. Winnipeg R.
20
Assiniboine River
Brandon
WINNIPEG
Souris River
19
Riv. Souris
12
CANADA
U.S.A.
R. Pembina R.
14
E.-U.-A.
15
Emerson
16
17
LEGEND LÉGENDE
WATER QUALITY ● SURVEILLANCE DE LA QUALITÉ DES EAUX
GEMS ▲ SMSE
SCALE ÉCHELLE
km 100 0 100 km

FIGURE 17 WATER QUALITY BRANCH MONITORING STATIONS 1986 - 87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986 - 87

D.4.1 NORTHWEST TERRITORIES

Région du Nord-ouest

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WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
30-86 NWT Water Quality Monitoring Network

SUBMITTER - 0001
C&P PROGRAM - 1.3* - Water Quality Management Data
DURATION - Ongoing since 1978

OBJECTIVES
In cooperation with Water Resources Branch (WRB), to monitor the quality of surface waters at 16 existing locations and 20 tentative locations in the NWT, to prepare the regional ambient water quality data reports and the periodic reports on the quality of the aquatic environment.

RATIONALE
Since the NWT are classified as Federal Lands the water quality at all 34 sites is considered to be of significant interest to Environment Canada and should be monitored. These data are required for regional reports on the quality of the aquatic environment.

DESCRIPTION
A total of 34 sites will be monitored as stations of significant federal interest. The majority are co-located with the hydrometric sites and are sampled by WRB at time of visit.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.12		0.12
	PY Tech	0.33	0.28	0.05		0.66
	Salary	11.7	9.9	5.9		27.55
	O & M	5.9	5.0	85.0		95.9
	Capital	1.6	1.4	0.0		3.0
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.33	0.28	0.17		0.78
Total Dollars		19.1	16.3	90.9		126.3

* Affiliated C&P Program(s) - 1.1

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
70	Mackenzie River near Fort Providence	00NW10FB0001	V
71	Camsell River at outlet of Clut Lake	00NW10JA0001	V
72	Coppermine River at outlet of Point Lake	00NW10PB0001	V
73	Tree River near the mouth	00NW10QA0001	V
74	Ellice River near the mouth	00NW10QD0001	V
75	Back River below Deep Rose Lake	00NW10RC0001	V
76	Great Bear River at outlet of Great Bear Lake	00NW10JC0001	V
77	Mackenzie River at Norman Wells	00NW10KA0001	V
78	Anderson River below Carnwath River	00NW10NC0001	V
79	Mackenzie River above Arctic Red River	00NW10LA0003	V
81	Quoich River above St Clair Falls	00NW06MB0001	V
82	Kazan River above Kazan Falls	00NW06LC0001	V
83	Baker Lake at Baker Lake	01NW06MA0001	V
84	Thelon River above Beverly Lake	00NW06JC0001	V
85	Lockhart River at outlet of Artillery Lake	00NW07RD0001	V
S1	Cameron River below Reid Lake	00NW07SB0011	V

Tentative New Northwest Territories Monitoring Stations

Map No.	Station Location	NAQUADAT Number	Sampling Frequency
	Kognack River below Mountain Lake		V
	Dubawnt River at outlet of Marjorie Lake		V
	Dubawnt R. above Dubawnt Lake		V
	Kazan River above Yathkyed Lake		V
	Hayes River above Chantry Lake		V
	Loillard River Above Daly Lake		V
	Snowdrift River at Outlet of Sitaza Lake		V
	Thoa River near Inlet to Hill Island Lake		V
	Mountain River Below Cambrian Lake		V
	Keele River above the mouth		V
	Mackenzie River at Fort Good Hope		V
	Mackenzie River above Oniak Channel		V
	Johnny Hoe River above Lac Ste Therese		V
	Horton River near the mouth		V
	Snare River at Inlet of Slemon Lake		V

Coppermine River at Bloodyfalls	V
Burnside River near the mouth	V
Back River below Beechy Lake	V
Yellowknife River near the mouth	V
Taltson River at outlet of Tsu Lake	V

SAMPLING MATRIX

Schema	LAB	Parms	All Stations (16)	All Tentative Stations (20)	Total
SA3	F	Phys(F)	V	V	186
SC1	B	MajorIon	V	V	186
SC2	S	Phys(L)	V	V	186
SC3	S	NFR	V	V	186
SD2	S	Nutrients	V	V	186
SE1	B	T Metals	V	V	186
SE3	B	Fe-Mn(Ext)	V	V	186
SF3	B	As-Se(L)	V	V	186
SF4	S	B(L)	V	V	186
SG1	S	Cn	*	*	44

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
90-86 NWT Water Quality Monitoring Network

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 390 Samples	Proj 390 TMU's	Proj 390 Cost
SA3	F	Phys(F)	106		
SC1	B	MajorIon	106	97.52	4987.30
SC2	S	Phys(L)	106		1213.70
SC3	S	NFR	106		921.14
SD2	S	Nutrients	106		6982.22
SE1	B	T Metals	106	89.04	4888.72
SE3	B	Fe-Mn(Ext)	106	4.24	233.20
SF3	B	As-Se(L)	106	31.80	1745.82
SF4	S	B(L)	106		581.94
SG1	S	Cn	40		183.20
SH8	S	Phenol	27		370.44
TOTAL	S		491	0.00	10252.64
TOTAL	B		424	222.60	11855.04
G TOTAL			1021	222.60	22107.68

Schema	LAB	Parms	Proj 390b Samples	Proj 390b TMU's	Proj 390b Cost
SA3	F	Phys(F)	65		
SC1	B	MajorIon	65	59.8	3058.25
SC2	S	Phys(L)	65		744.25
SC3	S	NFR	65		564.85
SD2	S	Nutrients	65		4281.55
SE1	B	T Metals	65	54.6	2997.80
SE3	B	Fe-Mn(Ext)	65	2.6	143.00
SF3	B	As-Se(L)	65	19.5	1070.55
SF4	S	B(L)	65		356.85
SG1	S	Cn	18		82.44
TOTAL	S		278	0.0	6029.94
TOTAL	B		260	136.5	7269.60
G TOTAL			603	136.5	13299.54

391-86 Mackenzie River Basin Bilateral Agreements

SUBMITTER - N/A
C&P PROGRAM - 1.1* - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES

1 To input to the development of bilateral agreements for the Mackenzie River Basin

2 To participate, as required, in the design of studies and negotiation of implementation agreements as an advisor to the Mackenzie River Basin Task Force or as a member of specific working groups which may be formed.

RATIONALE

WQB has the responsibility to provide data and analysis when requested on interprovincial river systems.

DESCRIPTION

Data requests will be responded to and analysis and advice provided as requested by the Mackenzie River Basin Task Force.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.07		0.07
	PY Tech					
	Salary			3.16		3.16
	O & M			2.80		2.80
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.07		0.07
Total Dollars				5.96		5.96

02-85 Interjurisdictional Network Monitoring by WRB

SUBMITTER - 0003
ECS PROGRAM ($ 000.) - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES

1. To conduct monthly or time of visit water quality sampling at the designated interjurisdictional locations.

2. To prepare the data collected from these sites for the detailed data reports.

RATIONALE
WQB has aresponsibility to measure the water quality of interjurisdictional river systems.

DESCRIPTION
Monthly or time of visit samples are collected for a wide spectrum of parameters. The governments concerned are notified of potential or real problems. The data are reviewed on an annual basis to assess the relative quality of the boundary streams.

COORDINATOR(S) - B. Olding

RESOURCES

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.01		0.01
	PY Tech	0.19	0.08	0.03		0.30
	Salary	6.5	2.7	1.4		10.6
	O & M	3.3	1.4			4.7
	Capital	0.9	0.4			1.3
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.19	0.08	0.04		0.31
Total Dollars		10.7	4.5	1.4		16.6

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
392-85 Interjurisdictional Network Monitoring by WRB

INDICATORS - N/A
PRIORITY - Sample Turnaround Time 16 week

DISSEMINATION OF LABORATORY DATA REPORTS

1 Project Coordinator

2 WESTORE

3 NAQUADAT

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 Update project description	February	
2 Undertake fieldwork	ongoing	Time of visit sampling
3 Lab Analysis	ongoing	Reports due 12 weeks from date of receipt of samples
4 Data verification	ongoing	
5 Review data and complete validation for data report		scheduliong in accordance with Project 3015

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
49	Slave River at Fitzgerald	00AL07NB0001	V
50	Hay River near Hay River town	00NW07OB0001	V
51	Liard River near the mouth	00NW10ED0002	V
80	Peel River anove Fort Macpherson	00NW10MC0002	V
**	Hay River below Indin Lake (proposed for October, 1986)	none yet assigned	V

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
392-85 Interjurisdictional Network Monitoring by WRB

SAMPLING MATRIX

Schema	LAB	Parms	Stn 49	Stn 50	Stn 51	Stn 80	Stn **	Totals
SA3	F	Phys(F)	V	V	V	V	V	37
SC1	B	MajorIon	V	V	V	V	V	37
SC2	S	Phys(L)	V	V	V	V	V	37
SC3	S	NFR	V	V	V	V	V	37
SD2	S	Nutrients	V	V	V	V	V	37
SE1	B	T Metals	V	V	V	V	V	37
SE3	B	Fe-Mn(Ext)	V	V	V	V	V	37
SF3	B	As-Se(L)	V	V	V	V	V	37
SF4	S	B(L)	V	V	V	V	V	37
SH1	B	Herbs(Old)	V					9
SH2	B	Herbs(New)	V					9
SH5	B	OC-PCB	V					9
SH8	S	Phenol	V					9
RADIONUCLIDES			V					1

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 392 Samples	Proj 392 TMU's	Proj 392 Cost
SA3	F	Phys(F)	45		
SC1	B	MajorIon	45	41.4	2117.25
SC2	S	Phys(L)	45		515.25
SC3	S	NFR	45		391.05
SD2	S	Nutrients	45		2964.15
SE1	B	T Metals	45	37.8	2075.40
SE3	B	Fe-Mn(Ext)	45	1.8	99.00
SF3	B	As-Se(L)	45	13.5	741.15
SF4	S	B(L)	45		247.05
SH1	B	Herbs(Old)	9	45.0	2108.70
SH2	B	Herbs(New)	9	45.0	2108.70
SH5	B	OC-PCB	9	30.6	1433.88
SH8	S	Phenol	28		384.16
TOTAL	S		208	0.0	4501.66
TOTAL	B		207	215.1	10684.08
G TOTAL			460	215.1	15185.74

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
393-86 NWT Water Quality Objectives Program

SUBMITTER - N/A
C&P PROGRAM - 1.1 - Interjurisdictional Water Management
DURATION - Ongoing

OBJECTIVES

1. To participate in the promotion and negotiation of water quality objectives with the Mackenzie River Basin Bilateral Alta-NWT Committee.
2. To initiate and develop ongoing contacts for the purpose of promoting water quality objectives with Parks Canada and the NWT Water Board.

RATIONALE

WQB has the responsibility to promote water quality objectives on all waters of federal interest, and to participate as required in their negotiation and implementation on interprovincial waters.

DESCRIPTION

The data requests and analysis of transboundary water quality provided to the Mackenzie River Basin Task Force will be used to identify water quality objectives at the Alta-NWT boundary. Ongoing contacts with the NWT Water Board and Parks Canada will be maintained to promote the establishment of water quality objectives on additional watercourses in the NWT.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.07		0.07
	PY Tech					
	Salary			3.16		3.16
	O & M			1.00		1.00
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.07		0.07
Total Dollars				4.16		4.16

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
84-85 DOE - INAC Water Quality Agreement

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - 1985-87

OBJECTIVE
To commence negotiations of a Canada - NWT water quality agreement with INAC.

RATIONALE
IWD will seek a water quality agreement with INAC in order .to: design a more cost-efficient monitoring network and data base; increase sampling capability where required; increase the comparability of water quality data between INAC and IWD; eliminate redundant monitoring; create an integrated data management system.

DESCRIPTION
The Yellowknife office currently administers an informal agreement with INAC wherein WSC picks up samples from 21 stations at time of visit for delivery to INAC. The formal water quality agreement will rationalize and integrate the two water quality monitoring programs.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.15		0.15
	PY Tech					
	Salary			6.78		6.78
	O & M			2.00		2.00
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.15		0.15
Total Dollars				8.78		8.78

395-86 Nahanni National Park Monitoring Agreement

SUBMITTER - 0001
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - Ongoing since April 1980

OBJECTIVES

To collect water samples on a time of visit basis from the Flat River and tentatively from two South Nahanni River sites, to provide an overview of water quality characteristics.

RATIONALE

IWD has a cost sharing Agreement with Parks Canada for hydrometric work in Nahanni Park. Included in this is the requirement for water quality monitoring on the Flat River. Funding status for the other two stations is as yet undetermined.

DESCRIPTION

Time of visit sampling is carried out by WRB at the hydrometric stations.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.01		0.01
	PY Tech	0.04	0.03	0.01		0.08
	Salary	1.2	1.0	0.7		1.9
	O & M	0.6	0.5	0.4		1.5
	Capital	0.2	0.1			0.3
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.04	0.03	0.02		0.09
Total Dollars		2.0	1.6	1.1		4.7

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
395-86 Nahanni National Park Monitoring Agreement

INDICATORS - N/A
PRIORITY - Relative Rank 5, Sample Turnaround Time 16 weeks

DISSEMINATION OF LABORATORY DATA REPORTS

1. Project Coordinator

2. Parks Canada

ACTIVITIES/REPORTING CALENDAR -
N/A

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
86	Flat River near mouth	00NW10EA0004	V
	South Nahanni River above Clausen Creek		V
	South Nahanni River upstream of Nahanni National Park		V

SAMPLING MATRIX

Schema	LAB	Parms	Stn 86	Stn	Stn	Totals
SA3	F	Phys(F)	V	V	V	18
SC1	B	MajorIon	V	V	V	18
SC2	S	Phys(L)	V	V	V	18
SC3	S	NFR	V	V	V	18
SD2	S	Nutrients	V	V	V	18
SE1	B	T Metals	V	V	V	18
SE3	B	Fe-Mn(Ext)	V	V	V	18
SF3	B	As-Se(L)	V	V	V	18
SF4	S	B(L)	V	V	V	18

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
395-86 Nahanni National Park Monitoring Agreement

ANALYTICAL REQUIREMENTS

Schema	LAB	Parms	Proj 395 Samples	Proj 395 TMU's	Proj 395 Cost
SA3	F	Phys(F)	18		
SC1	B	MajorIon	18	16.56	846.90
SC2	S	Phys(L)	18		206.10
SC3	S	NFR	18		156.42
SD2	S	Nutrients	18		1185.66
SE1	B	T Metals	18	15.12	830.16
SE3	B	Fe-Mn(Ext)	18	0.72	39.60
SF3	B	As-Se(L)	18	5.40	296.46
SF4	S	B(L)	18		98.82
TOTAL	S		72	0.00	1647.00
TOTAL	B		72	37.80	2013.12
G TOTAL			162	37.80	3660.12

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
96-86 Nahanni River Basin Study Plan

SUBMITTER - N/A
C&P PROGRAM - 1.3 - Water Quality Management Data
DURATION - 1986/1987

OBJECTIVE
To develop a plan for carrying out a baseline water quality survey in the South Nahanni River Basin.

RATIONALE
IWD has the responsibility to provide information on emerging trends in all waters of federal interest. A baseline water quality survey of the S. Nahanni River Basin is necessary, in order to determine the natural chemical characteristics of the basin, prior to intensive mine development.

DESCRIPTION
A study plan will be prepared with the assistance of the Regional Office of WQB, and in cooperation with Parks Canada, for a water quality survey in the South Nahanni River Basin, in FY 87/88.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.06		0.06
	PY Tech					
	Salary			2.71		2.71
	Capital					
	O & M			2.8		2.8
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.06		0.06
Total Dollars				5.51		5.51

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
397-86 MacKenzie River Hydrocarbon Survey

SUBMITTER - N/A
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - 1985 to 1987

OBJECTIVES
To carry out a baseline water quality survey, focusing on station evaluations, heavy metals and hydrocarbons on the Mackenzie River.

RATIONALE
IWD has the responsibility to provide information on emerging trends on all waters of federal interest. A baseline water quality survey on the Mackenzie River must be undertaken prior to anticipated intesinve mining and hydrocarbon development.

DESCRIPTION
The study is being undertaken in conjunction with NWRI, Winnipeg. The second survey will take plce during the summer of 1986. Sediment and water column analysis for metals and hydrocarbons will be carried out by NWRI.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.10		0.10
	PY Tech					
	Salary			4.8		4.8
	O & M			5.00		5.00
	Capital					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.10		0.10
Total Dollars				8.0		9.8

AFFILIATED C&P PROGRAM(S) - 1.3

[illegible]97-86 MacKenzie River Hydrocarbon Survey

STATION LIST

Map no.	Station location	NAQUADAT no.	Sampling frequency
1	Liard River at the Mouth		
2	Mackenzie River at Ft Simpson		
3	Mackenzie River at Wrigley		
4	Mackenzie River above Ft Norman		
5	Mackenzie River above Norman Wells		
6	Mackenzie River at Norman Wells		
7	Mackenzie River above Ft Good Hope		
8	Mackenzie River at Ft Good Hope		
9	Mackenzie River at Arctic Red River		

SAMPLING MATRIX

Note: All analyses are to be funded by recoverable resources from NOGAP

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
398-86 Toxic Chemicals Survey

SUBMITTER - N/A
C&P PROGRAM - 4.1* - Toxic Chemicals
DURATION - 1986/87

OBJECTIVES
To conduct extensive sampling for toxic chemicals in a basin designated by the WRB and tha WQB. This will enable us to better understand parameter flux during this period, and to assess the water quality in the basin.

RATIONALE
Parameter flux during freshet represints an important data gap for in the study of toxic particulates. The timing of the freshet survey with WRB high flow rating activities provides an opportunity to collect useful information in a cost-effective manner.

DESCRIPTION
Sampling will be undertaken prior to breakup by WSC on an approximate daily basis. Subsequent samples will be taken during summer low flow periods.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.07		0.07
	PY Tech	0.08	0.03	0.04		.15
	Salary	2.9	1.2	4.36		8.46
	O & M	1.5	0.6			2.1
	Capital	0.4	0.2			.6
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.08	0.03	.11		.22
Total Dollars		4.8	2.0	4.36		11.16

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
398-86 Toxic Chemicals Survey

AFFILIATED ECS PROGRAM(S) - 1.3

INDICATORS - N/A
PRIORITY - N/A

DISSEMINATION OF LABORATORY DATA REPORTS
N/A

ACTIVITIES/REPORTING CALENDAR

Milestone	Timing	Comments
1 In cooperation with WRB complete basin selection and logistical planning	April 15,1986	
2 Complete field work	Oct 15, 1986	
3 Prepare first draft of report using preliminary data, where available	Mar 31, 1987	
4 Print report	Mar 31, 1988	

STATION LIST
Note: stations have not yet been selected

SAMPLING MATRIX

Schema	LAB	Parms	Stns 1,2	Totals
SA3	F	Phys(F)	V	60
SC1	B	MajorIon	V	60
SC2	S	Phys(L)	V	60
SC3	S	NFR	V	60
SD2	S	Nutrients	V	60
SE1	B	T Metals	V	60
SE3	B	Fe-Mn(Ext)	V	60
SF3	B	As-Se(L)	V	60
SF4	S	B(L)	V	60
SH1	B	Herbs(Old)	V	60
SH2	B	Herbs(New)	V	60
SH5	B	OC-PCB	V	60
SH8	S	Phenol	V	60

WATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
399-86 Interjurisdictional Survey Monitoring

SUBMITTER - 0001
C&P PROGRAM - 1.1* - Interjurisdictional Water Management
DURATION - 1986/87 to 1987/88

OBJECTIVES

To carry our sampling for baseline characterization on two interjurisdictional rivers flowing between Alberta and NWT in conjunction with Indian and Northern Affairs Canada

RATIONALE

There are little or no data for the rivers to be selected, yet these rivers form part of the interjurisdictional agreement between Alberta and the GNWT, and in which IWD participates.

DESCRIPTION

Sampling will be undertaken during high and low flows by IWD and INAC personnel

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.07		0.07
	PY Tech	0.08	0.03	0.06		0.17
	Salary	2.9	1.1	5.16		9.16
	O & M	1.5	0.6	15.0		17.1
	Capital	0.4	0.2			0.6
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total		0.08	0.03	0.13		0.24
Total Dollars		4.8	1.9	20.16		26.86

ATER QUALITY BRANCH - WNR - PROGRAM OUTLINE - 1986/87
39-86 Interjurisdictional Survey Monitoring

STATION LIST
Stations not yet identified

SAMPLING MATRIX

Schema	LAB	Parms	All Stations (2)	Totals
SA3	F	Phys(F)	V	20
SC1	B	MajorIon	V	20
SC2	S	Phys(L)	V	20
SC3	S	NFR	V	20
SD2	S	Nutrients	V	20
SE1	B	T Metals	V	20
SE3	B	Fe-Mn(Ext)	V	20
SF3	B	As-Se(L)	V	20
SF4	S	B(L)	V	20
SH1	B	Herb(old)	V	4
SH2	B	Herb(new)	V	4
SH5	B	OIC-PCB	V	4
SH8	S	Phenol	V	4

3990-86 Development Projects Screening

SUBMITTER - N/A
C&P PROGRAM - 4.3 - Environment assessment and Baseline Studies
DURATION - Ongoing

OBJECTIVE

To fulfil NWT program responsibilities for FEARO and RSCC project reviews.

RATIONALE

IWD has the responsibility to advise on the suitability of project design when requested, in order to promote environmentally responsible development.

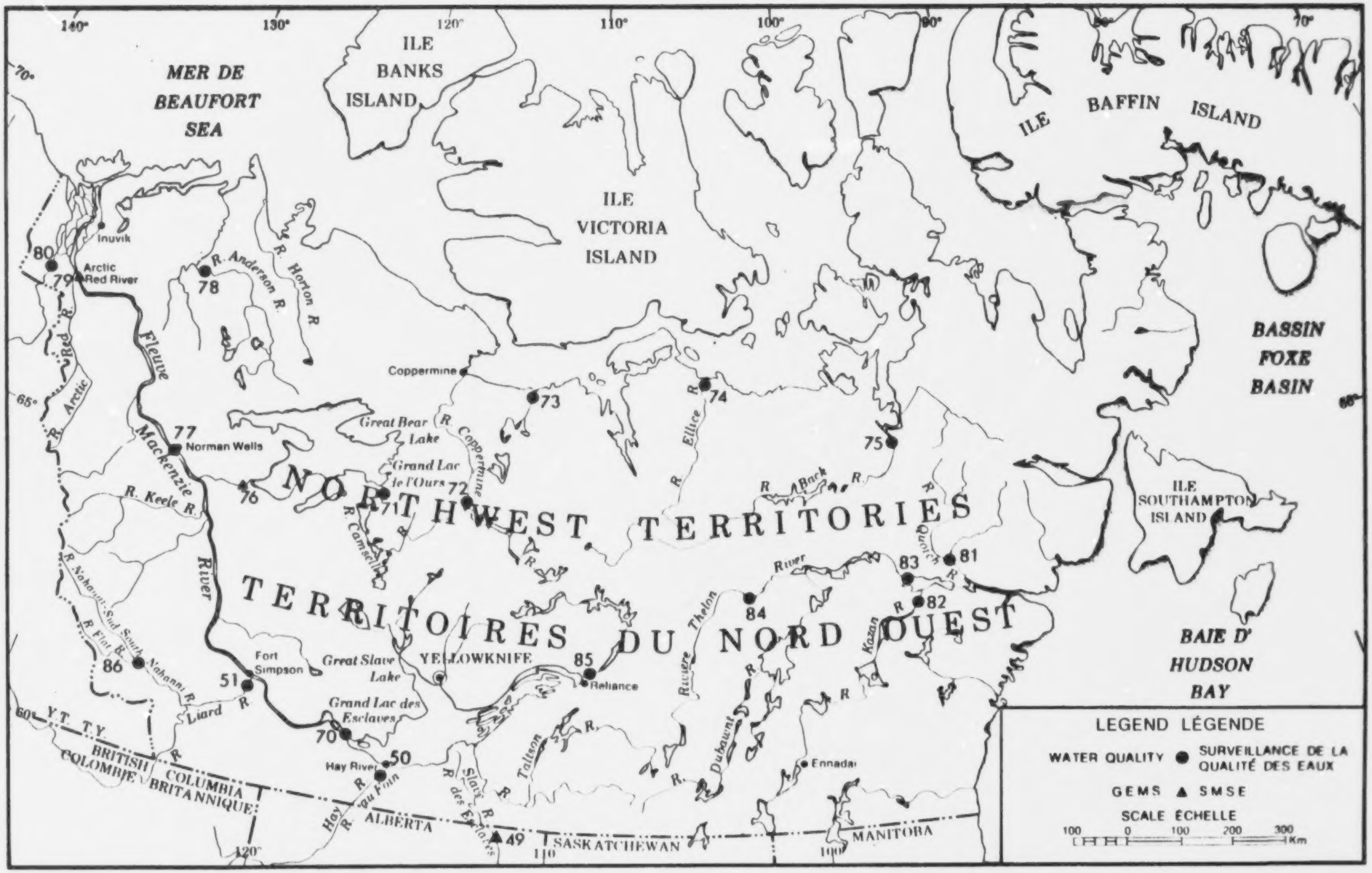
DESCRIPTION

All NWT projects referred by FEARO and the RSCC will be reviewed and commented upon.

COORDINATOR(S) - B. Olding

RESOURCES ($ 000.)

Category		Nat Lab	Reg Lab	Field	Admin.	Totals
A Base	PY Prof			0.09		0.09
	PY Tech					
	Salary			4.07		4.07
	Capital					
	O & M					
Recov.	PY Prof					
	PY Tech					
	Salary					
	O & M					
	Capital					
PY Total				0.09		0.09
Total Dollars				4.07		4.07


MER DE BEAUFORT SEA
ILE BANKS ISLAND
ILE VICTORIA ISLAND
ILE BAFFIN ISLAND
BASSIN FOXE BASIN
ILE SOUTHAMPTON ISLAND
BAIE D' HUDSON BAY
NORTHWEST TERRITORIES
TERRITOIRES DU NORD OUEST
YELLOWKNIFE
Inuvik
Arctic Red River
Coppermine
Norman Wells
Fort Simpson
Hay River
Reliance
Ennadai
Great Bear Lake
Grand Lac de l'Ours
Great Slave Lake
Grand Lac des Esclaves
Fleuve Mackenzie River
R. Anderson R.
R. Horton R.
R. Coppermine
R. Camsell
R. Keele R.
R. Nahanni-Sud South Nahanni R.
R. Flat R.
Liard R.
Hay R. au Foin
Slave R. des Esclaves
Taltson R.
Rivière Thelon River
Dubawnt R.
Kazan R.
Quoich R.
R. Back R.
R. Ellice R.
R. Arctic Red R.
Y.T. T.Y.
BRITISH COLUMBIA
COLOMBIE BRITANNIQUE
ALBERTA
SASKATCHEWAN
MANITOBA
140°
130°
120°
110°
100°
90°
80°
70°
65°
60°
80
79
78
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70
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49
LEGEND LÉGENDE
WATER QUALITY ● SURVEILLANCE DE LA QUALITÉ DES EAUX
GEMS ▲ SMSE
SCALE ÉCHELLE
100 0 100 200 300 Km

FIGURE 18 WATER QUALITY BRANCH MONITORING STATIONS 1986 - 87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ
DES EAUX 1986 - 87

D.5 PACIFIC AND YUKON REGION

Région du Pacifique et du Yukon

PROJECT DESCRIPTION
WATER QUALITY BRANCH Project
1986-87

Region: P&Y
Number : 02

PROJECT TITLE: Water Quality Objectives
Project Coordinator: D. Valiela TEL: 666-8002
Project Alternate(s): L.J. Zeman, W.E. Erlebach, D.D. MacDonald

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management

C&P CODE: 1.1

Goals: To provide management with information for negotiating, establishing and maintaining water quality ojectives on rivers where federal interest dictates by identifying uses, key water quality variables, toxic chemicals pollution, and its sources. To determine trends in aquatic environmental quality and assess conformity with water quality requirements used to control municipal and industrial discharges to receiving waters.

Rationale: By participating in the development of Water Quality Objectives on international, interprovincial and interjurisdictional waters within the region the Water Quality Branch is promoting the wise use of those resources.

Description:

a. Develop concepts and approaches to collect information and water quality data necessary to establish WQO's.

b. Support HQ staff in developing concepts and approaches for WQO's by:
   (i) Providing advice on Canadian Guidelines for Water Quality;
   (ii) Providing other support as required.

RESOURCES: A-base ($'000)

	1.1	Total
PY Technical	0.00	0.00
PY Professional	0.30	0.30
Total PY	0.30	0.30
Salary	13.7	13.7
O&M	0.0	0.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	13.7	13.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 03a

PROJECT TITLE: Flathead River WQO's
Project Coordinator: D. Valiela TEL: 666-8002
Project Alternate(s): D.D. MacDonald

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Water Quality Management Data/Toxic Chemicals

C&P CODE: 1.1/1.3/4.1

Goals: To provide management with information for negotiating, establishing and maintaining Water Quality Objectives on the Flathead River by identifying ambient levels and trends for key water quality variables. Provide information on the possible impacts of development on water quality in the river.

Rationale: Impending development of coal resources in the Flathead watershed is perceived as having considerable potential for impact on downstream users in the State of Montana through degradation of water quality. By participating in the formulation of WQO's for the Flathead, the Branch is promoting the wise use of that resource, and minimizing the potential for an international dispute.

Description: Using concepts and approaches developed, collect the information and water quality data necessary to establish WQO's for the Flathead River. Specifically to:

a. Collect site-specific data for four priority water quality variables
  - two trips by September 30, 1986
  - one trip by December 31, 1986
  - one trip by March 31, 1987;
b. Implement an intensive freshet sampling program for priority water quality variables;
c. Complete report on ammonia, nitrite and nitrate criteria for fish in he Flathead River by March 31, 1987;
d. Complete drafts on provisional water quality objectives and toxic metals criteria for fish in the Flathead River by March 31, 1987;
e. Provide support to I.J.C. as required.

RESOURCES: A-base ($'000)

	1.1	1.3	4.1	Total
PY Technical	0.0	0.0	0.0	0.00
PY Professional	0.35	0.40	0.05	0.80
Total PY	0.35	0.40	0.05	0.80
Salary	16.0	18.2	2.3	36.5
O&M	4.0	0.6	4.0	8.6
Contracts	0.0	6.9	0.0	6.9
Capital	0.0	2.8	4.0	6.8
Total	20.0	28.5	10.3	58.8

FLATHEAD RIVER WATER QUALITY MONITORING
STATION DESCRIPTION

Project No. 03

MAP NUMBER	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAMETERS
1	Flathead Rive 0.3 km above USA/Canada Border	00BC08NP0003	49 00 15	114 28 45	20	Nutrients Metals, NFR
2	Flathead River 1.3 km east of Marl Lake	00BC08NP0002	49 07 14	114 29 39	20	Nutrients Metals, NFR
3	Howell Creek 0.75 km above Flathead River Confluence	00BC08NP0008	49 05 08	114 31 32	20	Nutrients Metals, NFR
4	Howell Creek 0.4 km above Cabin Creek Confluence	00BC08NP0004	49 05 44	114 31 59	1-3	NFR

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 04

PROJECT TITLE: Similkameen River WQO's
Project Coordinator: L.J. Zeman TEL: 666-8004
Project Alternate(s): D. Valiela, D.D. MacDonald

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Toxic Chemicals

C&P CODE:1.1/4.1

Goals: To develop an understanding of water pollutant - aquatic environment interactions arising from changes in water quality attributable to land and water uses to facilitate the formulation of water quality objectives specific to the border reach of the Similkameen River.

Rationale: As a significant Interior Plateau stream, the Similkameen River is subject to heavy pollutant loadings from agricultural, urban and particularily mining sources. Investigations of toxic metals and organics in water, sediment, and fish, and of periphyton growth will contribute to the understanding of the human and environmental risks associated with the amounts and forms of toxic chemicals released into the river. This information, in turn, will facilitate the formulation of water quality objectives designed to protect beneficial water uses (domestic, agricultural and fisheries uses), and thereby limit the impact of developments in Canada on downstream users in the State of Washington to an acceptable level.

Description: Using the appropriate concepts and approaches, collect, analyze and interpret information and water quality data necessary to formulate site-specific WQO's for the Similkameen River. Specifically to:

a. Complete report on approaches to development of WQO's for the Similkameen River by March 31, 1987;
b. Complete analysis of data on existing levels of toxic metals in the Similkameen River by March 31, 1987;
c. Collect site-specific information on toxic metals and pesticides to facilitate development of WQO's
  - 1 trip by September 30, 1986
  - 1 trip by March 31, 1987.

RESOURCES: A-base ($'000)

	1.1	4.1	Total
PY Technical	0.00	0.00	0.00
PY Professional	0.10	0.70	0.80
Total PY	0.10	0.70	0.80
Salary	4.6	32.0	36.6
O&M	1.8	0.0	1.8
Contracts	0.2	5.0	5.2
Capital	0.0	0.0	0.0
Total	6.6	37.0	43.6

SIMILKAMEEN RIVER WATER QUALITY MONITORING
STATION DESCRIPTION

Project No. 04

R	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAMETERS
	Similkameen River at Border	00BC08NN0005	49 04 46	119 42 28	Variable	Metals Nutients Organics

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 05

PROJECT TITLE: Fraser River Estuary WQO's
Project Coordinator: D. Valiela TEL: 666-8002
Project Alternate(s): L.J. Zeman, W.E. Erlebach

NATIONAL PROGRAM NAME: Canada-United States and Interjurisdictional Water Management/Toxic Chemicals

C&P CODE: 1.1/4.1

Goals: To provide management with information for negotiating, establishing and maintaining Water Quality Objectives on the Fraser River Estuary by identifying ambient levels and trends for toxic chemicals. To provide management with recommendations for improving water quality conditions in the Estuary.

Rationale: The Lower Fraser is the most important area in this Region, both in terms of population and economics. Preliminary work on the identification of organic contaminants in sediment and biota has indicated that levels of toxic chemicals in the aquatic ecosystem may be problematic. The establishment and maintenance of Water Quality Objectives on the Lower Fraser will promote the wise use of that resource, and thereby minimize the potential for health risks and conflicts among water users.

Description: Support DOE in developing a Water Quality Plan and approaches to establishing Water Quality Objectives through participation as the federal-provincial program develops.

RESOURCES: A-base ($'000)

	1.1	4.1	Total
PY Technical	0.00	0.0	0.00
PY Professional	0.25	0.0	0.25
Total PY	0.25	0.0	0.25
Salary	11.4	0.0	11.4
O&M	0.0	0.0	0.0
Contracts	0.0	0.0	0.0
Capital	0.0	0.0	0.0
Total	11.4	0.0	11.4

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 3b

PROJECT TITLE: Flathead River WQO's - Eutrophication
Project Coordinator: D. Valiela TEL: 666-8002
Project Alternate(s): D.D. MacDonald

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

Goals: To provide management with information for negotiating, establishing and maintaining Water Quality Objectives on the Flathead River by developing site-specific water quality criteria for nutrients. Provide information on the possible impact of development (and associated elevated nutrient levels) on water quality and beneficial water uses in the river.

Rationale: Impending development of coal resources, and ongoing gas exploration and timber harvesting activities in the Flathead River watershed, is perceived as having considerable potential for impact on downstream users in the State of Montana through degradation of water quality. Nutrient levels and the potential for eutrophication of the Flathead River and Flathead Lake are specific concerns identified by downstream water users and U.S. government agencies. By participating in the formulation of WQO's for the nutrients in the Flathead River basin, the Branch is promoting the wise use of the aquatic resource, and is thereby minimizing the potential for an international dispute.

Description: Using concepts and approaches developed, collect information and water quality data necessary to establish WQO's for nutrients for the Flathead River.

RESOURCES:

	1.3	Total
PY Technical	0.15	0.15
PY Professional	0.20	0.20
Total PY	0.35	0.35
Salary	14.2	14.2
O&M	3.7	3.7
Contracts	0.0	0.0
Capital	0.0	0.0
Total	17.9	17.9

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 3c

PROJECT TITLE: Flathead River WQO's - Sediment
Project Coordinator: D.D. MacDonald TEL: 666-8003
Project Alternate(s): D. Valiela

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

Goals: To provide management with information for negotiating, establishing and maintaining Water Quality Objectives on the Flathead River by identifying ambient levels and trends for water-borne and deposited sediments. Provide information on the possible impact of development (and associated sediment) on water quality and beneficial water uses in the river.

Rationale: Impending development of coal resources, and ongoing gas exploration and timber harvesting activities in the Flathead River watershed are perceived as having considerable potential for impact on downstream users in the State of Montana through the degradation of water quality. Elevated levels of suspended sediment in water and deposited sediment in stream-bed substrates could have detrimental effects on beneficial water uses downstream of developments. By participating in the formulation of WQO's for sediment in the Flathead River basin, the Branch is promoting the wise use of the aquatic resource, and is thereby minimizing the potential for an international dispute.

Description: Using concepts and approaches developed, collect the information and water quality data necessary to establish WQO's for sediment designed to conserve and protect beneficial water uses, particularly fish and aquatic life, in the Flathead River basin. Specifically to:

a. Determine the seasonal variability in levels of fine sediment in natural bull trout spawning areas in the Flathead River basin (particularly in Howell Creek);
b. Collect information and data to facilitate development of a monitoring program for compliance with WQO's for suspended and deposited sediment
   - one trip by September 30, 1986
   - one trip by March 31, 1987;
c. Complete report on water quality criteria for suspended and deposited sediments in the Flathead River by March 31, 1987.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.00	0.00
PY Professional	0.40	0.40
Total PY	0.40	0.40
Salary	18.2	18.2
O&M	8.8	8.8
Contracts	0.0	0.0
Capital	0.0	0.0
Total	27.0	27.0

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 10

PROJECT TITLE: Stikine River
Project Coordinator: L.M. Churchland TEL: 666-8006
Project Alternate(s): C. Thorp

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To describe current water quality conditions and identify concerns related to the potential impact of dam construction on the Stikine River, which flows from British Columbia into the Alaskan Panhandle. This information will contribute to the design of a long-term monitoring program, the establishment of Water Quality Objectives, and the assessment of environmental changes.

Rationale: The Iskut-Stikine River basin in northwestern B.C. has been identified by the B.C. Hydro and Power Authority as a potential site for hydroelectric development. Officials for the State of Alaska have stated their concerns regarding the impact of this development on downstream ecology; thus the need for a federal response is clearly indicated.

Description: A report will be completed by March 31, 1987 on the relationship between bacterial counts, activity, and water quality variables in the Stikine River.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.6	5.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 16

PROJECT TITLE: Data and Interpretive Reports: Peace River
Project Coordinator: S.W. Sheehan TEL: 666-8007
Project Alternate(s): L.M. Churchland

NATIONAL PROGRAM NAME: Water Management Data

C&P CODE: 1.3

Goals: To complete and publish data and interpretive reports, including scientific papers on water quality studies, surveys, and related method development including documentation of software.

Rationale: Published reports are an essential form of communication in order that resource managers and their supporting technical staff, other members of the scientific and engineering communities, and the public at large become aware of conditions, trends and developments affecting the aquatic environment.

Description: The Peace River data report will be published.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.0	0.0
Total PY	0.0	0.0
Salary	0.0	0.0
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	1.0	1.0

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 18

PROJECT TITLE: Station Evaluation on the Quinsam River
Project Coordinator: T.L. Tremblay TEL: 666-8008
Project Alternate(s): L.M. Churchland

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

Goals: To develop a proposal for a station evaluation of the federal-provincial monitoring site on the Quinsam River.

Rationale: A federal-provincial monitoring station is currently being implemented on the Quinsam River, a major tributary to the lower portion of the Campbell River. Multiple and conflicting uses in the Campbell River Basin include hydroelectric power generation, fisheries, logging, domestic water supply and mining. The potential impacts of these varied uses on water quality make this location a high priority for a station evaluation, i.e. an intensive program of data collection to determine appropriate sampling sites, methods, frequency, variables and media (water, sediments or biota).

Description: The proposal will include a discussion of uses, a review of the hydrometric and water quality data, and a description of current water quality studies. The proposal will also contain a description of intensive studies to be conducted by WQB in 1987-89. At least one reconnaissance trip will be made to the Quinsam River by September 30, 1986.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.5	0.5
Total PY	0.5	0.5
Salary	22.8	22.8
O&M	2.0	2.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	24.8	24.8

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project Number : 19

PROJECT TITLE: Laboratory - Division Support Work
Project Coordinator: F.T.S. Mah TEL: 987-7756
Project Alternate(s): W.E. Erlebach

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

Goals: To provide professional advice and a regional perspective to management in developing national strategies for laboratory operations.

Rationale: By providing input into policy decisions, regarding laboratory operations, at the national level, the Branch is ensuring that the Regional requirements for precise water quality data are being met.

Description: Attend national meetings of Divisional Heads and provide input, as required, to Analytical Services Division requests.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	3.0	3.0
Contracts	0.0	0.0
Capital	5.0	5.0
Total	12.6	12.6

PROJECT DESCRIPTION WATER QUALITY BRANCH 1986-87	Region: P&Y Project Number : 20

PROJECT TITLE: Laboratory Management
Project Coordinator: F.T.S. Mah TEL: 987-7756
Project Alternate(s): G. Kan, T. Tuominen

NATIONAL PROGRAM NAME: Water Quality Management Data/Toxic Chemicals C&P CODE: 1.3/4.1

Goals: To provide laboratory facilities and services to ensure the continuing capability of the Regional operation.

Rationale: The management, administration, and common services associated with the Regional laboratory are identified as functions that are required to maintain an adequate capability to meet program needs.

Description: Common laboratory services provided include the maintenance of the laboratory, utilities, janitorial services, rent and tenant services, shipping and receiving, etc. Administrative functions provided include contracting-out, contracting-in as a service to other government agencies, cost accounting, cost recovery, budget control and technical administration. A quality control program will be maintained to ensure that the data produced are accurate and precise.

RESOURCES: A-base ($'000)

	1.3	4.1	Total
PY Clerical	1.0	0.0	1.0
PY Professional	0.2	0.0	0.2
Total PY	1.2	0.0	1.2
Salary	33.7	0.0	33.7
O&M	7.5	2.0	9.5
Contracts	0.0	30.5	30.5
Capital	9.2	0.0	9.2
Total	50.4	32.5	82.9

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 21

PROJECT TITLE: Inorganic Chemistry
Project Coordinator: F.T.S. Mah TEL: 987-7756
Project Alternate(s): N.L. Wade

NATIONAL PROGRAM NAME: Water Quality Management Data/Toxic Chemicals C&P CODE: 1.3/4.1

Goals: To provide capability to measure concentrations of inorganic constituents in water, sediment and biota; to conduct quality control programs required for trace metal samples forwarded to Burlington for analysis; to design and conduct quality control and quality assurance program required for federal/provincial and federal/territorial agreements; to provide advice on monitoring design and data interpretation related to water chemistry.

Rationale: By providing the capability to analyze for inorganic constituents in water, sediment and biota, instituting quality control programs for samples forwarded to the National Laboratory, and formulating and operating quality control-quality assurance program for federal/provincial and federal/territorial agreements, the Branch is strengthening its water quality data base, and is thereby providing information that will contribute to the wise use of the water resources in the Region.

Description: Support for inorganic analysis will be provided to Water Quality Branch projects. Quality control samples generated from the submissions to Burlington for analysis will be analyzed. Quality control-quality assurance program for federal/provincial and federal/territorial agreements will be designed and samples generated from the program will be analyzed.

RESOURCES:

	1.3	4.1	Total
PY Technical	2.00	0.00	2.00
PY Professional	0.35	0.05	0.40
Total PY	2.35	0.05	2.40
Salary	83.3	2.4	85.7
O&M	3.0	1.0	4.0
Contracts	0.0	34.0	34.0
Capital	0.0	0.0	0.0
Total	86.3	37.4	123.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 25

PROJECT TITLE:	Laboratory Relocation	
Project Coordinator:	F.T.S. Mah	TEL: 987-7756
Project Alternate(s):	W.E. Erlebach	

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

Goals: To plan for a new laboratory facility to meet Regional needs.

Rationale: By participating in the planning activities associated with the relocation of the Regional laboratory facilities, the Branch is ensuring that the requirements for analytical services will be met.

Description: A new laboratory facility will be planned in conjunction with the Department of Public Works and Facilities Management.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.5	4.5
O&M	0.0	0.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	4.5	4.5

* Resources will be diverted to this project only if Public Works Canada can respond to the needs of laboratory requirements.

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 26

PROJECT TITLE: Monitoring Division Support
Project Coordinator: P.H. Whitfield TEL: 666-8009
Project Alternate(s): A.C. Thorp

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide services of a general nature not attributable to specific projects.

Rationale: In order to maintain control over expenditures not directly attributable to specific projects.

Description: Overhead activities such as planning etc. of a divisional nature which cannot be directly attributed to a specific project. This activity also covers the cost of travel necessary to participate in national meetings of Divisional Heads.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	2.5	2.5
Contracts	0.0	0.0
Capital	0.0	0.0
Total	7.1	7.1

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 27

PROJECT TITLE: Federal Water Quality Monitoring, British Columbia

Project Coordinator: A.C. Thorp TEL: 666-8010
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data **C&P CODE:** 1.3

Goals: To provide continuing and pertinent water quality data responding to federal needs and interests in British Columbia, and where there is a potential for interjurisdicitonal disputes.

Rationale: A national overview of water quality conditions which can be used to respond to federal needs in developing general policy and legislation is required. Sampling at selected stations on a continuing basis also exhibits the federal presence and concern for water quality.

Description: Federal monitoring of a specific set of water quality variables at sites on interjursidictional, international (transboundary), interprovincial and provincial-territorial reaches is done with the cooperation of the Water Resources Branch and other agencies.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.00	0.00
PY Professional	0.55	0.55
Total PY	0.55	0.55
Salary	25.0	25.0
O&M	13.0	13.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	38.0	38.0

FEDERAL WATER QUALITY MONITORING, BRITISH COLUMBIA
STATION DESCRIPTION

MAP UMBER	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAM.
6	Bear River at Stewart	00BC08DC0001	55 57 15	129 58 23	5	Variable
7	Big Sheep Creek at Highway Bridge	00BC08NE0010	49 00 55	117 56 39	5	Variable
8	Boundary Creek at Midway	00BC08NN0010	49 00 06	118 45 38	5	Variable
9	Columbia River at Donald	00BC08NB0001	51 29 03	117 10 48	26	Variable
10	Fraser River at Red Pass	00BC08KA0007	52 59 17	119 00 33	26	Variable
11	Iskut River below Johnson River	00BC08CG0001	56 44 20	131 40 23	6	Variable
12	Kettle River at Carson	00BC08NN0021	49 00 00	118 29 48	26	Variable
13	Kettle River at Gilpin	00BC08NN0022	49 00 29	118 18 11	26	Variable
14	Kettle River at Midway	00BC08NN0011	49 00 16	118 46 28	26	Variable
15	Liard River at Lower Crossing	00BC10BE0004			6	Variable
16	Moyie River at Kingsgate	00BC08NH0010	49 00 16	116 57 46	5	Variable
17	Pend D'Oreille River at Waneta	00BC08NE0029	49 00 11	117 37 00	13	Variable
18	Sage Creek at Road Bridge	00BC08NP0006	49 04 13	114 27 55	13	Variable
19	Skagit River 2 km above Bdy Obelisk	00BC08PA0001	49 01 14	121 03 38	5	Variable
20	Stikine River above Choquette River	00BC08CF0002	56 49 45	131 45 50	6	Variable
21	Sumas River at Huntington	00BC08MH0027	49 00 10	122 13 50	13	Variable
22	Swift River at B.C. Yukon Border	00BC09AE0009	59 55 54	131 45 43	5	Variable

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 28

PROJECT TITLE: Federal Site Evaluations, British Columbia
Project Coordinator: A.C. Thorp TEL: 666-8010
Project Alternate(s): N. Rousseau

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To evaluate routine monitoring sites, ensuring that representative data are being gathered at each site.

Rationale: Maintaining a high standard of data for use in national overviews that may be required to respond to federal needs in developing general policy and legislation.

Description: A station evaluation study on the Kettle River to establish confidence limits for data by investigation of temporal and spatial variation at Kettle River monitoring sites is to be completed by October 1, 1986.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	0.5	0.5
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.1	5.1

PROJECT DESCRIPTION WATER QUALITY BRANCH 1986-87	Region: P&Y Project Number : 29

PROJECT TITLE: Federal Quality Assurance British Columbia
Project Coordinator: A.C. Thorp TEL: 666-8010
Project Alternate(s): N.J.W. Rousseau

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide assurance for routine monitoring sites, ensuring that valid data are being gathered at each site.

Rationale: Maintaining a high standard of data for use in national overviews that may be required to respond to federal needs in developing general policy and legislation.

Description: Collection of duplicate samples and site visits will be undertaken.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.6	5.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 30

PROJECT TITLE: Federal Water Quality Monitoring, Yukon
Project Coordinator: A.C. Thorp TEL: 666-8010
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide continuing and pertinent water quality data responding to federal needs and interests in the Yukon, and where there is a potential for interjurisdictional disputes.

Rationale: A national overview of water quality conditions which can be used to respond to federal needs in developing general policy and legislation is required. Sampling at selected stations on a continuing basis also exhibits the federal presence and concern for water quality.

Description: Federal monitoring of a specific set of water quality variables at sites on interjurisdiction, international (transboundary), and provincial-territorial reaches is doen with the cooperation of the Water Resources Branch and other agencies.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.2	0.2
Total PY	0.2	0.2
Salary	9.0	9.0
O&M	3.0	3.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	12.0	12.0

FEDERAL WATER QUALITY MONITORING, YUKON
STATION DESCRIPTION

MAP NUMBER	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAMETERS
23	Liard River at Fort Liard, N.W.T.	00NW10ED0001	64 14 35	123 28 45	13	Variable
24	Liard River at Upper Crossing	00YT10AA0001	60 03 00	128 53 58	6	Variable
25	Teslin River at Johnson's Crossing	00YT09AE0001	60 29 07	133 18 02	6	Variable
26	Yukon River at Eagle, Alaska	00AK09ED0001	64 47 20	141 11 48	26	Variable

PROJECT DESCRIPTION WATER QUALITY BRANCH 1986-87	Region: P&Y Project Number : 31

PROJECT TITLE: Federal Site Evaluations, Yukon
Project Coordinator: A.C. Thorp TEL: 666-8010
Project Alternate(s): N.J.W. Rosseau

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To evaluate routine monitoring sites, ensuring that representative data are being gathered at each site.

Rationale: Maintaining a high standard of data for use in national overviews that may be required to respond to federal needs in developing general policy and legislation.

Description: Evaluation of sites as potential monitoring sites based on existing information.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.6	5.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 32

PROJECT TITLE: Federal Quality Assurance, Yukon
National Program Name

Project Coordinator: A.C. Thorp TEL: 666-8010
Project Alternate(s): N.J.W. Rosseau

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide assurance for monitoring sites, ensuring that valid data are being gathered at each site.

Rationale: Maintaining a high standard of data for use in national overviews that may be required to respond to federal needs in developing general policy and legislation.

Description: Site visits and duplicate sampling will be undertaken.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.6	5.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 33

PROJECT TITLE: Federal/Provincial Agreement, British Columbia
Project Coordinator: P.H. Whitfield TEL: 666-8009
Project Alternate(s): W.E. Erlebach

NATIONAL PROGRAM NAME: Water Management Data **C&P CODE:** 1.3

Goals: Assist and participate in negotiations with the Province of British Columbia for a cost-shared water quality agreement.

Rationale: Supporting a federal policy to integrate with the provinces in providing complete and harmonized data from across Canada on a cost-shared basis which will respond to the specific requirements of the federal bureaucracy and reduce the potential for duplicating the expenditure of effort and resources by the two levels of government.

Description: Discussions with provincial representatives to formulate a list of joint monitoring activities, variables to be measured and development of monitoring strategies suitable for the monitoring objectives at each site.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	2.0	2.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	6.6	6.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 34

PROJECT TITLE: Federal/Territorial Agreement, Yukon
Project Coordinator: P.H. Whitfield TEL: 666-8009
Project Alternate(s): W.E. Erlebach

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: Assist and participate in negotiations with Indian and Northern Affairs in the Yukon for a cost-shared water quality agreement.

Rationale: Supporting federal policy to integrate with the provinces and territories to provide complete and harmonized data from across Canada on a cost-shared basis which will respond to the specific requirements of the federal bureaucracy and reduce the potential for duplicating the expenditure of effort and resources by the two levels of government.

Description: Discussions with INAC representatives to formulate a list of joint monitoring activities, variables to be measured and development of monitoring strategies suitable for the monitoring objectives at each site.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	6.0	6.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	10.6	10.6

PROJECT DESCRIPTION WATER QUALITY BRANCH 1986-87	Region: P&Y Project Number : 35

PROJECT TITLE: Monitoring Evaluations and Strategies
Project Coordinator: P.H. Whitfield TEL: 666-8009
Project Alternate(s): N.E. Dalley

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide assurance that monitoring strategies employed in monitoring programs are adequate to meet the ascribed goals of monitoring at each of the sites.

Rationale: Ensuring that the data gathering programs are maximizing the return on the investment of resources.

Description: Evaluations of statistical techniques and designs in relation to the desired goal of monitoring, evaluation of sampling frequency in relation to the goals of monitoring.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.2	0.2
Total PY	0.2	0.2
Salary	9.0	9.0
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	10.0	10.0

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 36

PROJECT TITLE: Coastal Stream Strategies
Project Coordinator: P.H. Whitfield TEL: 666-8009
Project Alternate(s): N.E. Dalley

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide assurance that monitoring strategies employed in monitoring programs are adequate to meet the ascribed goals of monitoring of coastal streams.

Rationale: Ensuring that the data gathering programs are maximizing the return on the investment of resources.

Description: Evaluations of statistical techniques and designs in relation to the desired goal of monitoring, evaluation of sampling frequency in relation to the goals of monitoring.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.6	5.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 37

PROJECT TITLE:	Compliance with Water Quality Objectives
Project Coordinator:	D. Valiela TEL: 666-8002
Project Alternate(s):	N. Rousseau, P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide assurance that monitoring strategies employed in monitoring programs are adequate to meet the ascribed goals of monitoring for compliance with objectives.

Rationale: Ensuring that the data gathering programs are maximizing the return on the investment of resources.

Description: Evaluations of statistical techniques and designs in relation to the desired goal of monitoring, evaluation of sampling frequency in relation to the goals of monitoring.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.6	5.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 38

PROJECT TITLE: Yukon River Basin Study
Project Coordinator: P.H. Whitfield TEL: 666-8009
Project Alternate(s):

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To complete the preparation of a scientific paper on results obtained during the Yukon River Basin Study.

Rationale: Completion of work started under the Canada Water Act study of the Yukon River Basin.

Description: Complete final revisions to manuscript and pay publication costs.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.05	0.05
Total PY	0.05	0.05
Salary	2.3	2.3
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	3.3	3.3

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 39

PROJECT TITLE: Kootenay River East
Project Coordinator: N.E. Dalley TEL: 666-8011
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To evaluate the impact of point source pollution from industrial sources and estimate nutrient loadings within the Kootenay River East sub-basin.

Rationale: The portion of the Kootenay river under consideration feeds into Lake Koocanusa, an international body of water. Concerns relate to the potential for dispute arising from upstream activities within British Columbia impinging on the quality of this international underway.

Description: Preparation of reports will continue in this fiscal year with the final two reports completed. These reports deal with 1) changes in nutrient concentrations inthe St. Mary River between 1975 and 1980-82; and 2) nutrient loadings in the sub-basin.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	0.5	0.5
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.1	5.1

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 40

PROJECT TITLE: Computer Services Activities
Project Coordinator: N.E. Dalley
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide services of a general nature not attributable to specific projects, and provide support to the Directorate by participation in the Information Technology Committee (ITC).

Rationale: In order to maintain control over expenditures not directly attributable to specific projects. Participation in the ITC will allow us to provide input in areas which affect our operations or areas where we can assist others with their needs.

Description: This activity primarily covers the cost of travel necessary to participate in national meetings of the ITC and PY for regional EDP coordination. Specifically it will include the following: provide regional input to the ITC-IWD on a variety of issues and topics as they arise; attend the ITC meetings in Ottawa twice yearly to voice regional concerns; prepare the annual Information Technology and Systems Plan for SID which becomes part of the Department's submission to Treasury Board; produce regional plans and recommendations for multibranch facilities; comment on proposed EDP acquisitions by the branches.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.05	0.05
Total PY	0.05	0.05
Salary	2.2	2.2
O&M	2.5	2.5
Contracts	0.0	0.0
Capital	0.0	0.0
Total	4.7	4.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 41

PROJECT TITLE:	Computer Services	
Project Coordinator:	N.E. Dalley	TEL: 666-8011
Project Alternate(s):	P.H. Whitfield	

NATIONAL PROGRAM NAME: Water Management Data

C&P CODE: 1.3

Goals: To provide general computer services to facilitate the working operations of the Branch. To take advantage of computerized functions where these can increase branch productivity.

Rationale: This computer services project has facilitated our ability to provide computing services to the branch. We have acquired additional in-house terminals with high speed error-free access to service bureaux facilities. The Branch is in a position to negotiate favourable contracts with these services thereby controlling expenditures, and enhancing the usefulness of these facilities. In addition services are being provided by microcomputers which are contributing a growing portion of computing capabilities to the branch because of their low cost and widely available, inexpensive software.

Description: Support for computer processing of water quality data through software and system utilities. Specific projects and results: continued staff training on the use of both microcomputer and mainframe software; development of a water quality data base system using the ORACLE relational database management system and report on the implementation; report on the procedure for transferring documents from word processing and other microcomputer systems to mainframes; investigate acquisition of additional computing facilities for the Branch; investigate capabilities and costs of local area networks (LAN's) which will allow communication between various IWD processors with the capability of interfacing with future additional acquisitions; determine specifications necessary for new equipment such that it will be able to interface with LAN.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.4	0.4
Total PY	0.4	0.4
Salary	18.2	18.2
O&M	43.0	43.0
Contracts	0.0	0.0
Capital	13.0	13.0
Total	74.2	74.2

PROJECT DESCRIPTION WATER QUALITY BRANCH 1986-87	Region: P&Y Project Number : 42

PROJECT TITLE: Electronic Data Acquisition - Laboratory
Project Coordinator: N.E. Dalley TEL: 666-8011
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To assist the Water Quality Laboratory in specifying the requirements for automatic data acquisition from analytical instruments.

Rationale: There is a potential for reducing the manpower required to produce laboratory data in machine readable form. Specification of the type of system that will handle this is the first step in converting the lab to automatic data acquisition.

Description: Prepare an inventory of current laboratory instruments detailing the input and output capabilities of each; review available information on existing technology and prepare a proposal describing the types of equipment which will satisfy the lab's requirements. Purchase and test and IBM PC compatible data acquisition board.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.05	0.05
Total PY	0.05	0.05
Salary	2.3	2.3
O&M	0.5	0.5
Contracts	0.0	0.0
Capital	2.0	2.0
Total	4.8	4.8

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 43

PROJECT TITLE: Electronic Data Acquisition - Field
Project Coordinator: N.E. Dalley TEL: 666-8011
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To demonstrate effective operation of a continuous monitoring electronic water quality station with telephone and telemetry capabilities. To establish a satellite data gathering platform to enable the testing of new technology in data gathering.

Rationale: There is a potential for reducing the costs of certain monitoring efforts through new technology. Testing and development of this new technology is the first step in realizing the potential savings.

Description: Select a versatile data acquisition device which can be programmed by the user to suit various study conditions. Redesign enclosure for sensors. Deploy and test modems which allow for remote polling of field data acquisition devices. Review available information on existing satellite, shortwave, and land mobile satellite technology and prepare a proposal for acquisition of necessary equipment to allow use of field devices with satellite platform or telemetry equipment. Negotiate with Water Resources Branch for use in methods development and equipment testing.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.4	0.4
Total PY	0.4	0.4
Salary	18.2	18.2
O&M	4.0	4.0
Contracts	0.0	0.0
Capital	8.0	8.0
Total	30.2	30.2

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 44

PROJECT TITLE: British Columbia Agreement Computer
Project Coordinator: N.E. Dalley TEL: 666-8011
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide computer data entry, transfer and storage in support of the B.C. Agreement.

Rationale: Data gathered under the B.C. Agreement must be transferred to the province and received from the province in a timely manner.

Description: Design and implement procedures for the timely transfer of data to and from the province.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	0.0	0.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	4.6	4.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 45

PROJECT TITLE: Yukon Agreement Computer
Project Coordinator: N.E. Dalley TEL: 666-8011
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data **C&P CODE:** 1.3

Goals: To provide computer data entry, transfer and storage in support of the Yukon Agreement.

Rationale: Data gathered under the Yukon Agreement must be transferred to the territory and received from the territory in a timely manner.

Description: Design and implement procedures for the timely transfer of data to and from the territory.

RESOURCES: A-base ($'000)

	Total
PY Technical	
PY Professional	
Total PY	0.0
Salary	
O&M	
Contracts	
Capital	
Total	0.0

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 46

PROJECT TITLE: Federal/Provincial Monitoring Division Support
Project Coordinator: P.H. Whitfield TEL: 666-8009
Project Alternate(s): N.J.W. Rousseau

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide services of a general nature not attributable to specific projects.

Rationale: In order to maintain control over expenditures not directly attributable to specific projects.

Description: Overhead activities such as planning etc. of a divisional nature which cannot be directly attributed to a specific project. This activity also covers the cost of travel necessary to participate in meetings.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.25	0.25
Total PY	0.25	0.25
Salary	11.4	11.4
O&M	0.0	0.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	11.4	11.4

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project Number : 47

PROJECT TITLE: Federal/Provincial Monitoring British Columbia
Project Coordinator: N.J.W. Rousseau TEL: 666-8012
Project Alternate(s): P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data **C&P CODE:** 1.3

Goals: To achieve a continuing commitment by the federal and provincial governments to the acquisition of water quality data and to obtain scientifically sound water quality information and achieve compatability between respective water quality data bases for water resources managment purposes.

Rationale: To provide for the coordination and integration of federal and provincial water quality monitoring activities to develop comprehensive assessment on the quality of the aquatic environment in a cost-shared and work-shared manner.

Description: Monitoring of a specific set of water quality variables at fixed intervals on a continuing basis at sites described in the federal/provincial agreement.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.45	0.45
Total PY	0.45	0.45
Salary	20.6	20.6
O&M	20.0	20.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	40.6	40.6

FEDERAL/PROVINCIAL WATER QUALITY MONITORING
STATION DESCRIPTION

MAP NUMBER	STATION LOCATION	NAQUADAT NUMBER	LATITUDE	LONGITUDE	SAMPLING FREQUENCY	PARAM.
27	Fraser River at Hansard	00BC08KA0001	54 04 39	121 50 48	26	Variable
28	Fraser River at Marguerite	00BC08MC0001	52 31 48	122 26 33	26	Variable
29	Fraser River at Hope	00BC08MF0001	49 23 14	121 27 03	26	Variable
30	Nechako River at Prince George	00BC08KE0010	53 55 38	122 45 54	26	Variable
31	Thompson River at Spences Bridge	00BC08LF0001	50 25 15	121 20 29	26	Variable
32	Peace River above Alces River	00BC07FD0005	56 07 34	120 03 22	26	Variable
33	Skeena River at Usk	00BC08EF0001	54 38 02	128 24 33	26	Variable
34	Quinsam River near the Mouth	00BC08HD0004	50 02 16	125 17 35	26	Variable
35	Columbia River at Revelstoke	00BC08ND0002	51 00 20	118 13 06	13	Variable
36	Columbia River at Birchbank	00BC08NE0005	49 10 37	117 43 03	26	Variable
37	Columbia River at Waneta	00BC08NE0001	49 01 40	117 36 10	52	Variable
1	Flathead River at US Border	00BC08NP0003	49 00 15	114 28 45	52	Variable
38	Kootenay River at Canal Flats	00BC08NF0006	50 08 51	115 47 58	26	Variable
39	Kootenay River at Fenwick Station	00BC08NG0009	49 31 41	115 32 52	26	Variable
40	Koocanusa Lake at US Border	01BC08NG0001	48 59 55	115 10 48	7	Variable
41	Kootenay River at Creston	00BC08NH0005	49 07 01	116 34 46	26	Variable
42	Elk River at Phillips Bridge	00BC08NK0002	49 12 54	115 06 35	26	Variable
43	Okanagan River at Oliver	00BC08NM0001	49 06 52	119 33 54	26	Variable
5	Similkamen River near U.S. Border	00BC08NL0005	49 04 46	119 42 28	26	Variable
44	Old Wolf Lake (Victoria)	01BC08HA0001	48 30 00	123 40 05	12	Variable
45	Lizard Lake near Port Renfrew	01BC08HA0002	48 36 20	124 13 20	12	Variable
46	Spectacle Lake near Malahat Summit	01BC08HA0003	48 34 41	123 34 07	12	Variable
47	Maxwell Lake, Saltspring Island	01BC08HA0004	48 49 19	123 32 12	12	Variable

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 48

PROJECT TITLE:	Federal/Provincial Quality Assurance British Columbia
Project Coordinator:	N.J.W. Rousseau TEL: 666-8012
Project Alternate(s):	P.H. Whitfield

NATIONAL PROGRAM NAME: Water Management Data C&P CODE: 1.3

Goals: To provide assurance for routine monitoring at Federal/Provincial sites, ensuring validity and compatibility of all data collected under the agreement.

Rationale: Maintaining a high standard of data for use in national and provincial overviews that may be required to respond to federal and/or provincial needs in developing general policy and legislation.

Description: As described in the Federal/Provincial agreement, schedule E.

RESOURCES: A-base ($'000)

	1.3	Total
PY Technical	0.0	0.0
PY Professional	0.3	0.3
Total PY	0.3	0.3
Salary	13.7	13.7
O&M	7.0	7.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	20.7	20.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project Number : 01

PROJECT TITLE: Branch Support
Project Coordinator: W.E. Erlebach TEL: 666-6038
Project Alternate(s): G. Moyle

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To provide common services to facilitate operations with the Branch.

Rationale: In order to maintain control over expenditures not directly attributable to specific projects, common services have been grouped in a Support Service category.

Description: Training, conferences, journal subscriptions and library stock will be supported at an appropriate level to ensure the availability of opportunities to maintain Branch expertise. Hydro and communication systems are provided, including telephones, telecopiers, etc. Secretarial and technical support not specific to other projects, together with general management and planning functions are included. Fleet management, including gas/oil and maintenance services, will also be provided.

RESOURCES: A-base ($000)

	4.1	Total
PY Technical	1.85	1.85
PY Professional	1.15	1.15
Total PY	3.00	3.00
Salary	0.0	103.6
O&M	0.0	40.5
Contracts	0.0	0.0
Capital	0.0	14.0
Total	146.8	158.1

P R O J E C T   D E S C R I P T I O N
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 06

PROJECT TITLE:	Surveys - Division Support	
Project Coordinator:	L.M. Churchland	TEL: 666-8006
Project Alternate(s):	S.W. Sheehan, T.M. Tuominen	

NATIONAL PROGRAM NAME: Toxic Chemicals   C&P CODE: 4.1

Goals: To provide professional advice and a regional perspective to headquarters management in developing national strategies for water quality monitoring, surveys, and assessments. To provide support in planning and operations of the Water Quality Branch and Surveys and Interpretation Division.

Rationale: By providing input into policy decisions at the national level, the Branch is ensuring that Regional concerns are being considered and addressed. Planning and management are required to ensure the effective operations of the Surveys and Interpretation Division, and the Water Quality Branch.

Description: Attend meetings of Heads, Monitoring and Surveys Division and provide input, as required. Provide input to long-term operational plans, work plans; review proposals, reports, and correspondence; participate in meetings, workshops, staffing and job evaluations as required.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.4	0.4
Total PY	0.4	0.4
Salary	18.2	18.2
O&M	3.5	3.5
Contracts	0.0	0.0
Capital	2.0	2.0
Total	23.7	23.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 07

PROJECT TITLE: Columbia River - Water Chemistry and Modelling of Toxicants

Project Coordinator: S.W. Sheehan TEL: 666-8007
Project Alternate(s): L.M. Churchland

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To enhance the design of a water quality model to estimate concentrations of relevant toxicants and associated variables in the Columbia River at Waneta, a water quality station located upstream of the U.S.-Canada Border. To interpret chemistry data collected from previous surveys and provide recommendations for monitoring water quality conditions.

Rationale: Approval of requests for effluent discharges from the lead-zinc smelter and fertilizer complex at Trail often result in the discharge of toxicants to the Columbia River under various flow conditions. In order to estimate the toxicant levels above and immediately below the U.S.-Canada border resulting from anticipated discharges a predictive model is required. The interpretation of water chemistry data will assist in developing appropriate water quality monitoring programs.

Description: A model will be designed to estimate toxicant levels at the Waneta station. The model will be tested with data collected from previous surveys. A data report is to be finished by March 31, 1987 on the detailed water chemistry surveys covering the period 1978-1984, statistical analysis for an interpretive report is expected to be 50% completed by March 1987.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.5	0.5
Total PY	0.5	0.5
Salary	22.8	22.8
O&M	1.5	1.5
Contracts	6.5	6.5
Capital	0.0	0.0
Total	30.8	30.8

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 08

PROJECT TITLE: Columbia River (toxicants in fish)
Project Coordinator: S.W. Sheehan TEL: 666-8007
Project Alternate(s): L.M. Churchland, T.M. Tuominen

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To compile and interpret mercury, heavy metal and hepatic metallothionein data collected for the fish of the Columbia River. To collect fish for the purpose of determining levels of metals in tissue and livers.

Rationale: The data acquired from the Columbia River is to be interpreted with respect to the health and welfare edibility standards and to be statistically analyzed for possible trends in the levels of metals in fish tissues. The surveys and subsequent interpretations of the data are undertaken to insure that provisions of the Boundary Waters Treaty are met.

Description: Data from fish samples collected from field trips for the period 1976-1983 will be interpreted and a final report is to be completed by September 30, 1987.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	4.0	4.0
Capital	0.0	0.0
Total	9.6	9.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 09

PROJECT TITLE: Columbia River - Biological

Project Coordinator: T.M. Tuominen TEL: 980-6915
Project Alternate(s): S.W. Sheehan

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To identify present conditions and potential concerns associated with the disposal of metals and nutrients into the aquatic environment, particularly the relationships between nutrients, metals and algal growth.

Rationale: The Columbia River is a major international river that has been the subject of a number of intensive water quality surveys over the past 6 years. Concern has been identified about the introduction of nutrients and potentially toxic materials into the river, especially in relation to possible detrimental effects on the water quality in British Columbia and downstream in the State of Washington, U.S.A.

Description: A data report will be published and an interpretive report will be 75% completed in 1986-87. These reports present the results and interpretations of an algal bioassay study investigating the effects of nutrient and heavy metal discharges on the algal growth potential in the Columbia River, downstream of Trail, B.C.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.2	0.2
Total PY	0.2	0.2
Salary	9.1	9.1
O&M	4.0	4.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	13.1	13.1

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 11

PROJECT TITLE:	Environmental Referrals	
Project Coordinator:	S.W. Sheehan	TEL: 666-8007
Project Alternate(s):	L.M. Churchland	

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

Goals: To provide professional advice and a Federal perspective on environmental contamination issues. To assist in the assessment of spills and provide advice on assessment approaches including modelling.

Rationale: By providing advice on water quality issues of national significance, the Branch promotes the wise use of aquatic resources.

Description: Advice on water quality concerns will be provided as required to WPM and other federal agencies, and to the provincial government, particularly with respect to Cominco, the lead-zinc smelter at Trail, B.C. Two technical reports on software will be published.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.4	0.4
Total PY	0.4	0.4
Salary	18.2	18.2
O&M	5.0	5.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	23.2	23.2

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 12

PROJECT TITLE: Toxic Metal Speciation
Project Coordinator: T.L. Tremblay TEL: 666-8008
Project Alternate(s): F.T.S. Mah

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To adapt a method for the measurement of the labile (potentially toxic) fraction of copper and zinc in water.

Rationale: Heavy metals can be present in natural waters as free ions or as inorganic or organic complexes. The free ions and their weak complexes have generally higher toxicities than the other forms, including strong complexes, colloids and particulates. A measurement of the chemically labile fraction of a given heavy metal will have more biological significance than total, acid - extractable or dissolved metal concentrations, which are not correlated with toxicity.

Description: The method chosen for heavy metal speciation studies is ion-exchange chromatography with a chelating resin, Chelex-100. Studies with synthetic solutions of copper and zinc at different pH values and humic acid concentrations will be completed and a protocol applicable to natural waters will be proposed. An interpretive report will be 50% completed by March 31, 1987.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.5	0.5
Total PY	0.5	0.5
Salary	22.8	22.8
O&M	0.5	0.5
Contracts	0.0	0.0
Capital	0.0	0.0
Total	23.3	23.3

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 13

PROJECT TITLE: Fraser River, Data Compilation
Project Coordinator: T.M. Tuominen TEL: 980-6915
Project Alternate(s): L.M. Churchland

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To investigate the feasibility of using periphytic algae to monitor for trace metals in the lower Fraser River.

Rationale: The DOE toxic chemicals committee has designated top priority to the lower Fraser River and estuary with respect to concerns about toxic chemicals in the aquatic environment. It is important to establish methods for monitoring toxic chemicals in the environment so that trends in the levels of toxic chemicals can be determined.

Description: A draft of a report on the effect of the presence of sediment on the use of periphytic algae for monitoring metals in the lower Fraser River will be written.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	0.0	0.0
Contracts	3.5	3.5
Capital	0.0	0.0
Total	8.1	8.1

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 14

PROJECT TITLE: Fraser River - Biological and Bed Sediments
Project Coordinator: T.M. Tuominen TEL: 980-6915
Project Alternate(s): L.M. Churchland, F.T.S. Mah

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To investigate the presence and concentrations of selected toxic chemicals in the biota and bed sediments of the lower Fraser River and estuary. To evaluate the usefulness of biota and bed sediments to monitor for selected toxic chemicals in this habitat.

Rationale: The DOE toxic chemicals committee has designated top priority to the lower Fraser River and estuary with respect to concerns about toxic chemicals in the aquatic environment. The river receives industrial, agricultural, and domestic wastes from upstream and lower mainland sources. The Fraser also supports the largest commercial salmon run in Canada and, therefore, an understanding of the aquatic quality of this river is essential.

Description: Sampling will be conducted during pre-freshet and post-freshet periods to identify optimal sites for collecting biota and bed sediments at the various reaches of the river and estuary. The organisms most suitable for collection will be determined also. Sample material will be provided to the National Laboratory for quality control tests on analytical accuracy and sample preservation.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.5	0.5
Total PY	0.5	0.5
Salary	22.8	22.8
O&M	3.0	3.0
Contracts	0.0	0.0
Capital	2.0	2.0
Total	27.8	27.8

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 15

PROJECT TITLE: Sediment Collection - Fraser River

Project Coordinator: L.M. Churchland TEL: 666-8006
Project Alternate(s): F.T.S. Mah, T. Tuominen

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

Goals: To develop accurate, efficient techniques for the concentration of suspended sediments for analysis of toxic organic contaminants.

Rationale: High levels of toxic organic contaminants such as PAH's and chlorophenols have been identified in one or more of the following media: water, sediments, and biota. The report of the Working Committee on Fraser River Estuary Monitoring has emphasized the importance of monitoring the input of contaminants to the estuary and their presence in the environmnent. This study and related studies of biota and water will complement the data collected under the routine monitoring program, and provide data on a greater number of toxic contaminants.

Description: Two sampling cruises will be taken to the Fraser River Main Arm in June and December, representing high and low flows, respectively. Sediments (dependent on obtaining a continuous flow centrifuge) will be concentrated for analysis of chlorophenols, dioxins, dibenzofurans, selected metals, organic carbon and particle size.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.5	0.5
Total PY	0.5	0.5
Salary	22.8	22.8
O&M	9.5	9.5
Contracts	0.0	0.0
Capital	18.0	18.0
Total	50.3	50.3

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project Number : 17

PROJECT TITLE: Okanagan River
Project Coordinator: L.J. Zeman TEL: 666-8004
Project Alternate(s): L.M. Churchland

NATIONAL PROGRAM NAME: Toxic chemicals C&P CODE: 4.1

Goals: Dissemination of information on findings from the federal-provincial water quality monitoring program. This information is requested by the B.C. Ministry of Environment, Okanagan Sub-Region for developing their Waste Management Plan for the City of Penticton.

Rationale: The continuing growth in human settlements, recreational, industrial, and agricultural based developments is placing an increasing stress on receiving waters in the Okanagan Basin. There is a continuing request for reliable estimates, with known precision, of nutrient and ionic loads, discharged from point and non-point sources into receiving waters. As an international river, and with growing urban and rural developments in the basin, the assessment of chemical loads from variable sources is warranted.

Description: Using water quality data obtained from innovative field sampling strategies, undertaken by the Water Quality Branch, a paper on Implications of Nitrogen Transport by the Okanagan River will be prepared and published in 1986.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.1	0.1
Total PY	0.1	0.1
Salary	4.6	4.6
O&M	1.0	1.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	5.6	5.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 22

PROJECT TITLE:	Organic Chemistry	
Project Coordinator:	G.Y.P. Kan	TEL: 987-3543
Project Alternate(s):	F.T.S. Mah	

NATIONAL PROGRAM NAME: Toxic Chemicals   **C&P CODE**: 4.1

Goals: To provide expertise on sampling for toxic organic chemicals, such as pesticides and PCB's, to support the programs of the Water Quality Branch. To support quality control programs for samples submitted to the Burlington laboratory for organic analysis and to provide advice and assistance on monitoring and interpretation of data related to toxic organic chemicals.

Rationale: By providing resources, quality control and chemical expertise for the analysis of toxic organic chemicals in the environment, the Branch is promoting the generation of meaningful information that will meet its responsibilities for the toxic chemicals program.

Description: Support in toxic organic chemicals will be provided by:

a. Conducting the quality control programs on samples submitted to Burlington for analysis by analyzing splits, spikes, blanks and standards;
b. Preparing samples by extraction and clean-up techniques for shipment to Burlington for analysis, when necessary;
c. Modifying previously developed sampling techniques to meet the needs of the Region;
d. Advising on sampling methodology to be used and interpretation of results;
e. Attending committee meetings and reviewing papers dealing with Toxic Chemicals Programs.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.3	0.3
Total PY	0.3	0.3
Salary	13.7	13.7
O&M	4.0	4.0
Contracts	0.0	0.0
Capital	0.0	0.0
Total	17.7	17.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project
Number : 23

PROJECT TITLE: Toxic Organics in Fraser River Estuary - Water
Project Coordinator: G.Y.P. Kan TEL: 987-3543
Project Alternate(s): F.T.S. Mah

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To carry out pilot studies required for the measurement of levels of toxic organic compounds in the Fraser River Estuary water.

Rationale: The lower Fraser is the most important area in this Region. With the exception of the limited work done under TOXFUND contract in 1983-84 and 1984-85 and the chlorophenol investigation by N.W.R.I. in 1984-86 very little is known about the toxic organics in the lower Fraser waters. In view of the importance of the Fraser it is warranted to assign resources to investigate the toxic organics in the Fraser River Estuary water.

Description: A comparison of two different methods of sampling organic contaminants in water (solvent extraction and resin adsorption) will be made. Two or more trips to the Fraser River Estuary will be conducted so that spike and recovery studies on chlorinated phenols using the two methods can be made.

When and if supplementary resources are available the following studies will be made:

a. The variability of chlorophenols in starry flounder within one age group and in different age groups will be investigated;
b. The stability of dinoseb in the aquatic environment will be investigated after the pesticide is experimentally sprayed.

RESOURCES: A-base ($'000)

			Part a*		Part b*	
	4.1	Total	4.1	Total	4.1	Total
PY Technical	0.0	0.0	0.0	0.0	0.0	0.0
PY Professional	0.9	0.9	0.1	0.1	0.1	0.1
Total PY	0.9	0.9	0.1	0.1	0.1	0.1
Salary	41.0	41.0	4.6	4.6	4.6	4.6
O&M	2.0	2.0	2.0	2.0	2.0	2.0
Contracts	0.0	0.0	0.0	0.0	0.0	0.0
Supplementary Res.	0.0	0.0	30.0	30.0	35.0	35.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0
Total	43.0	43.0	36.6	36.6	41.6	41.6

* These two projects are contingent on receipt of supplementary resources. Funding of these two projects will result in 0.2 PY's and $4.0 O&M of A base being diverted from other Toxic Chemicals projects.

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986-87

Region: P&Y
Project Number: 24

PROJECT TITLE: Biology
Project Coordinator: T. Tuominen TEL: 980-6915
Project Alternate(s): F.T.S. Mah

NATIONAL PROGRAM NAME: Toxic Chemicals C&P CODE: 4.1

Goals: To adapt biological techniques for monitoring of water quality and to apply them to surveys of boundary reaches of rivers and other reaches within the Branch's mandate where problems associated with toxic chemcials may be of concern.

Rationale: The increasing priority given to toxic chemicals, with the advantages of using biological measurements for monitoring these toxicants in the aquatic environment have warranted the assignment of the major portion of the biology field and laboratory resources to the Toxic Chemicals Program.

Description: For this project, the following activities will be conducted:

a. Algal samples collected from the Flathead River and tributaries will be identified, enumerated, and analyzed for chlorophyll a content;
b. Biological and bed sediment samples collected from the lower Fraser River will be prepared for chemical analysis;
c. Suspended sediment samples collected from the lower Fraser River will be analyzed for particle size distribution;
d. Another component of this project is the interpretation of the results from various analyses.

RESOURCES: A-base ($'000)

	4.1	Total
PY Technical	0.0	0.0
PY Professional	0.2	0.2
Total PY	0.2	0.2
Salary	9.1	9.1
O&M	6.0	6.0
Contracts	28.0	28.0
Capital	0.0	0.0
Total	43.1	43.1

SCHEDULE E

Quality Assurance

According to Article V of this Agreement, the parties agree to implement a quality assurance program to ensure the compatibility of all data collected by the parties under this Agreement. The program will address compatibility in field sampling and measurements, laboratory procedures, and data management as outlined below.

The Coordinating Committee shall formulate a quality assurance program and ensure that it is performed. The quality assurance program will include, but not be limited to:

1. the establishment and revision of sample collection procedures to assure valid and representative samples for surface waters, biota and sediments;
2. the establishment and revision of field measurement methods, including calibration and maintenance of field equipment;
3. the establishment and revision of sample preservation protocols;
4. the appropriateness of sample containers;
5. the establishment and revision of procedures for laboratory analyses;
6. the establishment and revision of procedures for keeping laboratory records on sample handling;
7. the establishment and revision of criteria for the use of sample controls, spiked samples, replicate sampling and analysis, and reagent blanks;
8. the review of data to assure that only the data that meet acceptance criteria are reported and stored;
9. the documentation of changes in sampling, analysing and data management procedures;
10. the implementation of methods that reflect technological advances; and
11. the design and implementation of studies for the verification of data generated under this Agreement.

PROVINCIAL STATIONS

NAQUADAT # NOT ASSINED YET
SYSTEM FOR ENVIRONMENT ASSESSMENT MANAGEMENT (IT IS THE PROVINCIAL EQUIVALENT OF NAQUADAT).

STATIONS CHARACTERISTICS

STATION	NAQUADAT	SEAM	LATITUDE	LONGITUDE
WESTWOOD LAKE NEAR NANAIMO		E206289	49 09 40	124 00 00
STOCKING LAKE NEAR LADYSMITH		E2062900	48 57 30	123 49 07
JACOBS LAKE (MARION) MAPLE RIDGE			49 18 40	122 32 46
ROLLEY LAKE NEAR WHONNOCK			49 14 40	122 23 15
BUTTLE LAKE AT GOLD RIVER BRIDGE		0130080	49 50 33	125 37 15
COWICHAN RIVER AT OUTLET OF COWICHAN LAKE		E206108	48 49 25	124 03 30
COWICHAN RIVER AT HIGHWWAY 1		0120802	48 46 19	123 41 47
COWICHAN RIVER 1 KM D/S SOMENOS CREEK		E206106	48 46 26	123 39 58
BESSETTE CREEK U/S LUMBY STP		0500293	50 15 09	118 57 37
DEEP CREEK U/S DUTCH DAIRIES		0500258	50 26 46	119 12 17
DEEP CREEK NEAR MOUTH		0500020	50 20 49	119 17 39
BAILEY CREEK, VERNON		0500901	50 10 47	119 20 21
BRANDT'S CREEK, KELOWNA		0500319	49 53 45	119 28 56
OKANAGAN RIVER AT HIGHWAY 97 PENTICTON		0500050	49 29 46	119 36 58
SHINGLE CREEK AT MOUTH NEAR PENTICTON		0500066	49 28 46	119 35 56
ELLIS CREEK U/S OKANAGAN RIVER		050027	49 28 36	119 35 43
SIMILKAMEEN RIVER U/S PRINCETON STP		0500724	49 27 39	120 28 55
SIMILKAMEEN RIVER U/s KEREMEOS		0500692	49 12 01	119 50 29
SIMILKAMEEN RIVER 3600M D/S KEREMEOS		0500693	49 11 45	119 47 10
BOUNDARY CREEK U/S GREENWOOD		0200500	49 05 44	118 40 39
BOUNDARY CREEK 3 KM SOUTH GREENWOOD		0200501	49 03 31	118 41 36
KETTLE RIVER U/S GRAND FORKS STP		0200149	49 01 46	118 25 45
WILLOW RIVER AT HIGHWAY 26 NEAR WELLS		0600133	53 06 08	121 34 08
LITTLE HORSEFLY RIVER AT ROAD		0800003	52 22 26	121 19 20
LITTLE HORSEFLY RIVER BELOW LAKE		0800015	52 22 17	121 20 09
LITTLE HORSEFLY RIVER ABOVE GARDNER ROAD		0800004	52 21 38	121 23 35
DRAGON LAKE NEAR QUESNEL		0603017	52 57 25	122 24 37

WILLIAMS LAKE RIVER AT LAKE OUTLET	0600013	52 07 19	122 07 50
WILLIAMS LAKE RIVER NEAR MOUTH	0600529	52 09 52	122 16 08
ELK RIVER U/S ELKFORD STP	0200218	50 01 08	114 54 43
ELK RIVER ABOVE SPARWOOD STP	0200103	49 43 51	114 54 00
LINE CREEK NEAR THE MOUTH	0200044	49 53 34	114 49 32
FORDING RIVER AT MOUTH	0200396	49 53 09	114 52 23
ALEXANDER CREEK U/S MICHEL CREEK	0200430	49 40 24	114 46 46
MICHEL CREEK U/S ALEXANDER CREEK	0200429	49 40 27	114 46 48
MICHEL CREEK AT NATAL BRIDGE	0200025	49 43 45	114 51 22
ELK RIVER D/S LIZARD CREEK	0200397	49 27 11	115 04 01
KOOTENAY LAKE, CAPE HORN	0200034	49 35 58	116 50 49
KOTTENAY LKAE AT FRASER RAPIDS	0200012	49 37 03	116 59 34
LAKELSE RIVER ABOVE SKEENA RIVER	0400211	54 26 32	128 45 42
KITIMAT RIVER AT KITMAT	0430025	54 03 24	128 40 53
KISPIOX RIVER AT VILLAGE	0400205	55 20 50	127 41 49
BULKLEY RIVER NEAR HOUSTON	0400296	54 23 48	126 42 33
BULKLEY RIVER AT QUICK	0920088	54 37 04	126 53 48
TELKWA RIVER AT TELKWA	0400187	54 41 42	127 03 12
MORICE RIVER ABOVE BULKLEY RIVER	0400203	54 22 32	126 44 55
FRASER AT RIVER AT STONER	E206182	53 28 18	122 39 52
SHUSWAP RIVER D/S ENDERBY	0500498	50 33 49	119 08 30
VERNON CREEK AT KAL LAKE OUTLET			
COLDSTREAM CREEK			

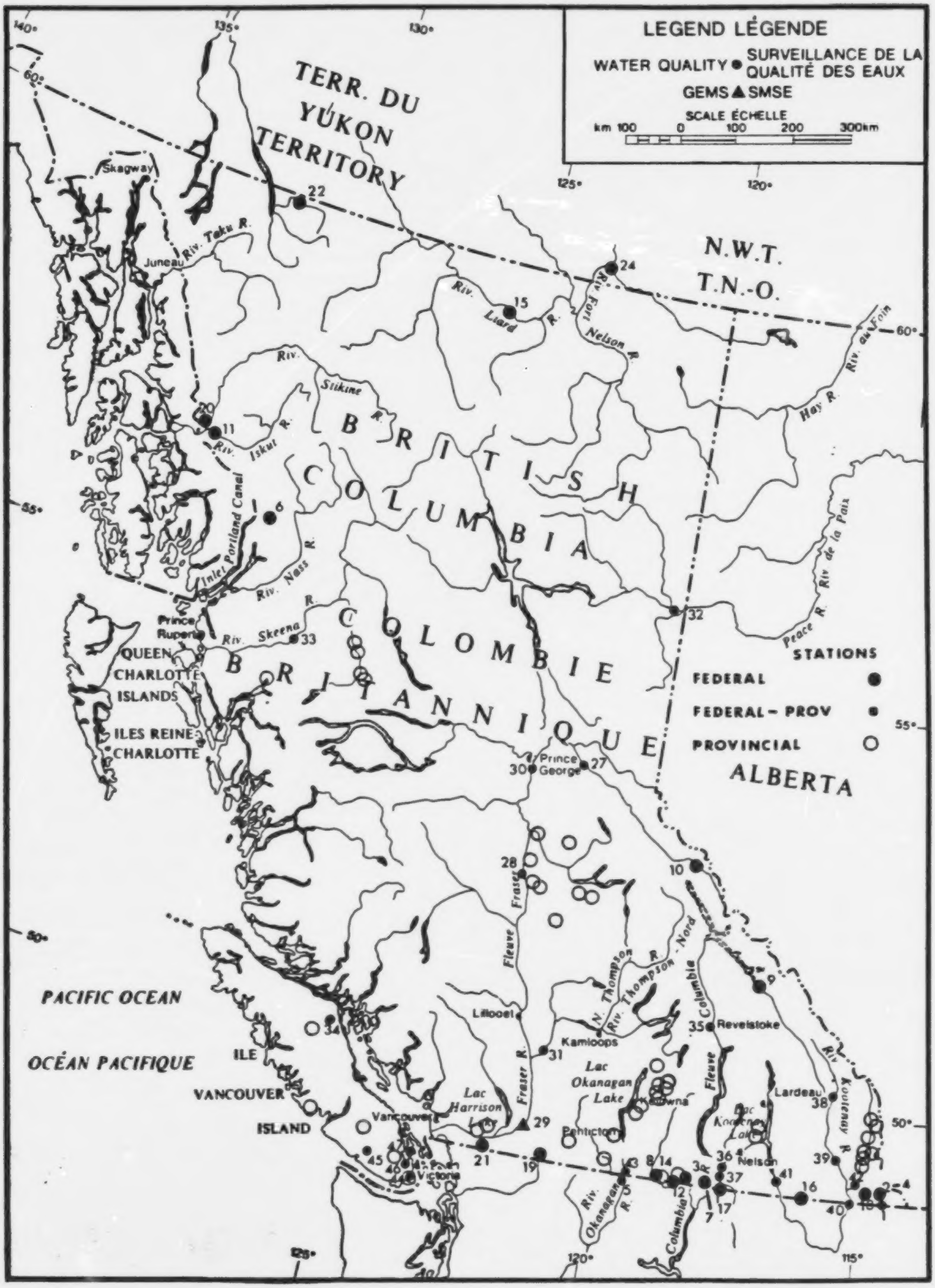
LEGEND LÉGENDE
WATER QUALITY ● SURVEILLANCE DE LA QUALITÉ DES EAUX
GEMS ▲ SMSE
SCALE ÉCHELLE
km 100 0 100 200 300km
STATIONS
FEDERAL ●
FEDERAL - PROV ●
PROVINCIAL ○
TERR. DU YUKON TERRITORY
N.W.T. T.N.-O.
BRITISH COLUMBIA
COLOMBIE BRITANNIQUE
ALBERTA
PACIFIC OCEAN
OCÉAN PACIFIQUE
QUEEN CHARLOTTE ISLANDS
ILES REINE CHARLOTTE
ILE VANCOUVER ISLAND
Skagway
Juneau
Prince Rupert
Prince George
Lillooet
Kamloops
Revelstoke
Kelowna
Penticton
Nelson
Lardeau
Vancouver
Victoria
Riv. Taku R.
Riv. Stikine R.
Riv. Iskut R.
Riv. Nass R.
Riv. Skeena R.
Riv. Liard R.
Riv. Fort Nelson R.
Hay R.
Riv. au Foin
Peace R. Riv. de la Paix
Fleuve Fraser
Fraser R.
N. Thompson R.
Riv. Thompson Nord
Fleuve Columbia
Columbia R.
Riv. Okanagan R.
Riv. Kootenay R.
Portland Canal Inlet
Lac Okanagan Lake
Lac Harrison Lake
Lac Kootenay Lake
140° 135° 130° 125° 120° 115°
60° 55° 50°
1 2 3 4 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 24 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 45 46

FIGURE 19 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

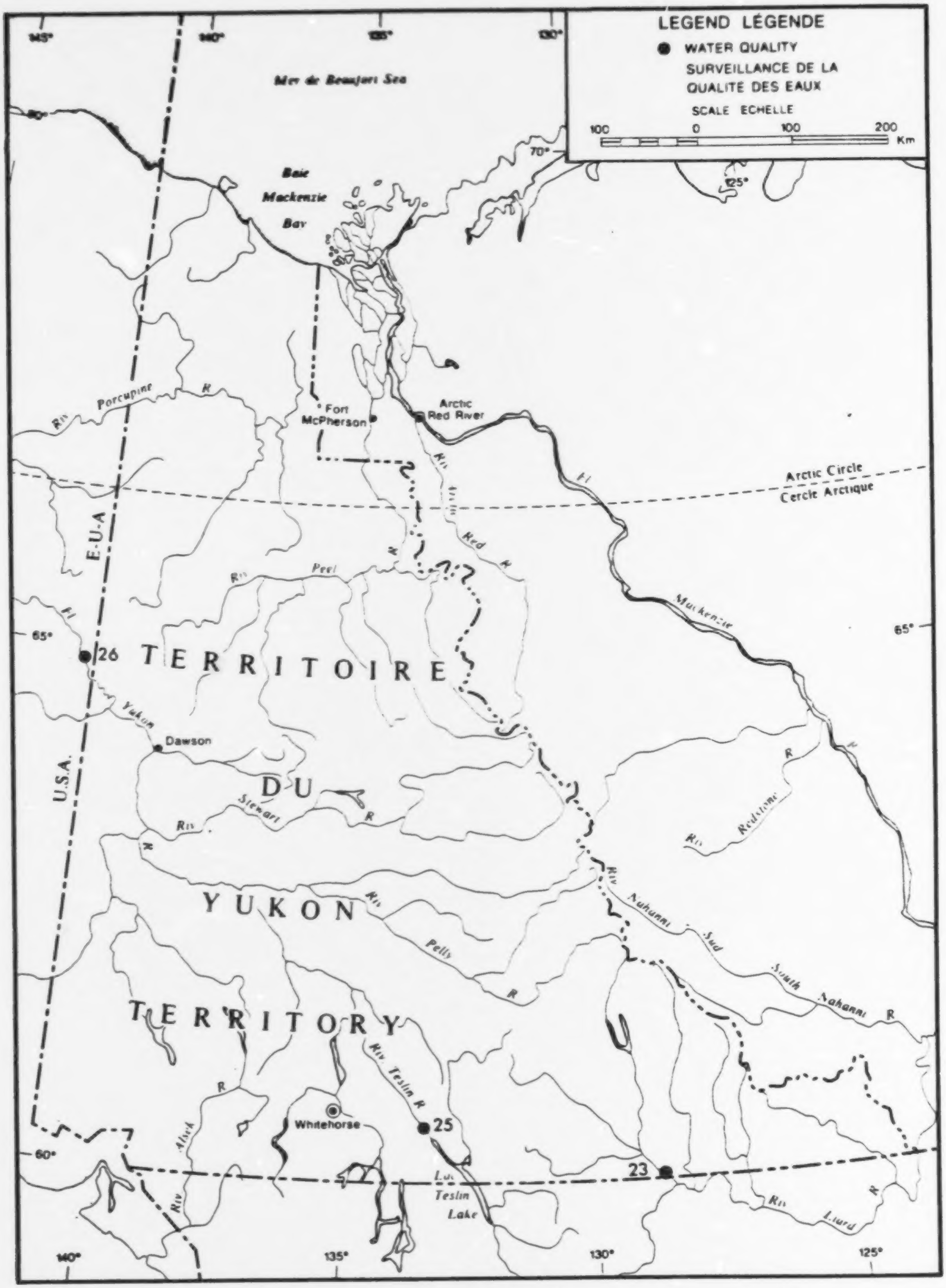
LEGEND LÉGENDE
● WATER QUALITY
SURVEILLANCE DE LA
QUALITE DES EAUX
SCALE ECHELLE
100
0
100
200
Km
145°
140°
135°
130°
125°
70°
65°
60°
Mer de Beaufort Sea
Baie Mackenzie Bay
Fort McPherson
Arctic Red River
Arctic Circle
Cercle Arctique
Riv. Porcupine R.
Riv. Peel R.
Riv. Arctic Red R.
Fl. Mackenzie R.
Fl. Yukon
Dawson
Riv. Stewart R.
Riv. Pelly R.
Riv. Redstone R.
Riv. Nahanni Sud South Nahanni R.
Riv. Teslin R.
Riv. Alsek R.
Riv. Liard R.
Whitehorse
Lac Teslin Lake
E.-U.-A.
U.S.A.
TERRITOIRE DU YUKON
YUKON TERRITORY
26
25
23

FIGURE 20 WATER QUALITY BRANCH MONITORING STATIONS 1986-87
STATIONS DE SURVEILLANCE DE LA DIRECTION DE LA QUALITÉ DES EAUX 1986-87

D.7 HEADQUARTERS

ADMINISTRATION CENTRAL

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION HQ
PROJECT NO. OBJ-1

PROJECT TITLE: OTTAWA RIVER

NATIONAL PROGRAM NAME: Canada-US and Interjurisdictional Water Management

C&P CODE: 1.1

DURATION: on-going

STUDY TEAM: D. McGirr, K. Thibault, Director WQB

TEL: (819) 997-1920

GOALS:

1. Chair Coordinating Committee for Water Quality in Ottawa River and its technical subcommittee.
2. Prepare second annual report of the coordinating committee.

RATIONALE: The lower part of the Ottawa River is interprovincial.

DESCRIPTION: The Coordinating Committee for Water Quality of the Ottawa River, and its technical subcommittee, were formed by Ontario, Quebec and the federal government (WQB). This year the technical subcommittee will probably concentrate on intercomparison of test methods and on special projects related to dissolved oxygen and nutrients.

A-BASE RESOURCES ($'000)

	Total
PY TECH.	
PROF.	1.0
TOTAL PY	1.0
SALARIES	43.7
O&M	
CONTRACTS	4.0
CAPITAL	-
TOTAL	47.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION HQ
PROJECT NO. OBJ-2

PROJECT TITLE: INFORMATION AND ADVICE ON WATER QUALITY OBJECTIVES

NATIONAL PROGRAM NAME: Canada/US and Interjurisdictional Water Management

C&P CODE: 1.1

DURATION: On-going

STUDY TEAM: D. McGirr, A.R. Davis

TEL: 997-1920

GOALS:

1. Provide support to PPWB/COWQ and GLWQB/AEOC.
2. Complete report on water quality objective policy, prepare a borchure on objectives and a report on boundary waters.
3. Provide support to committees developing objectives for the Souris, Milk, St. Clair and other rivers.

RATIONALE: The work on objectives is almost entirely on international and interprovincial waters.

DESCRIPTION:

Personnel from WQB headquarters sit as observers on the Aquatic Ecosystem Objectives Committee of the IJC Great Lakes Water Quality Board and on the Committee on Water Quality of the Prairie Provinces Water Board.

Water Quality Branch headquarters prepares policy documents and other documents of national scope including the Water Quality Objectives Program paper, an objectives brochure (in preparation) and a report on boundary water quality which is planned for 86-87.

Headquarters provides assistance to the regions on request.

A-BASE RESOURCES ($'000)

	Total
PY TECH.	
PROF	1.0
TOTAL PY	1.0
SALARIES	43.8
O&M	4.0
CONTRACTS	
CAPITAL	-
TOTAL	47.8

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION HQ
PROJECT NO. A-1

PROJECT TITLE: MONITORING AND FEDERAL-PROVINCIAL AGREEMENTS

NATIONAL PROGRAM NAME: Water Quality Management Data

C&P CODE: 1.3

STUDY TEAM: D. Haffner, T. Dafoe, D. Bondy, R. Kwiatkowski,
L. Désilets, E. Watt

TEL: (819) 997-3422

GOALS:

1. Complete negotiations with New Brunswick, Manitoba and Alberta; continue negotiation with Ontario and initiate negotiations with Saskatchewan, Nova Scotia, P.E.I. and the Territories
2. Implement and review Quebec, Newfoundland and B.C. Agreements.
3. Develop multi-media monitoring techniques, e.g. holding Northern Water Quality Monitoring Workshop, formulate levels and effects monitoring strategy.
4. Review technical plans for Quebec, B.C. and Newfoundland to ensure adequate water quality data.
5. Provide centralized administration for financial and scientific aspects of agreements.

RATIONAL

There is a need for a comprehensive water quality assessment strategy in Canada using multi-media sampling. The cost efficient means of achieving this assessment is through federal-provincial agreements that will encourage exchange of information and cooperative studies and will make water quality data directly available to provincial and federal water quality managers. A national baseline toxic chemicals program should be part of the Federal-Provincial Water Quality Agreements.

DESCRIPTION

As described in the "Water Quality Branch Strategy for Assessment of the Quality of the Aquatic Environment (1986).

A-BASE RESOURCES ($'000)

	A-Base	Cost Recoverable	Total
PY PROF.	4.00	-	
TOTAL PY	4.00	-	4.0
SALARIES	177.5	-	177.5
O & M	45.0	407.0*	452.0
CONTRACTS	-	-	-
CAPITAL	-	-	-
TOTAL $	222.5	407.0	629.5

* This amount is placed in a reserve fund. It can be used only if the money is cost recovered through the F/P Agreements.

July 18, 1986

Status of the Federal-Provincial Water Quality Monitoring Agreements

Province	Negotiations		Agreements	Signature
	Start	Completed	Signed	Projected
Quebec	Sept. 1982	December 1983	May 1984	
British Columbia	December 1983	June 1985	October 1985	
Newfoundland	October 1983	November 1985	April 1986	
Alberta	May 1983	May 1986		October 1986
New Brunswick	Nov. 1984			March 1987
Manitoba	May 1984			June 1987
Saskatchewan	Sept. 1985			December 1987
Ontario	April 1986			December 1987
Prince Edward Island	June 1986			June 1987
Nova Scotia	To commence Nov. 1986			March 1988
Yukon	December 1985			March 1987
Northwest Territories	To commence Dec. 1986			March 1987

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT
NUMBER S&IS-2

PROJECT TITLE: WATER QUALITY MANUALS AND GLOSSARY

NATIONAL PROGRAM NAME: Water Quality Management Data

C&P CODE: 1.3

STUDY TEAM: A. Demayo, E. Watt

Tel: (819) 997-3423

GOALS:

As part of the WQB's effort to document the methodology for all phases of water quality monitoring, a "Field Quality Assurance Manual", a manual on "Data Presentation and Analysis"and a glossary will be completed and printed in the FY 1986-87.

RATIONALE:

The WQB, in carrying out its mandate to provide water quality information, must ensure that the data collected is scientifically valid. The two manuals and the glossary will contribute to this objective. In addition, they will form a basis for the training of the staff and for disseminating recommended methods for water quality monitoring.

DESCRIPTION:

The following manuals will be prepared:

1. Field Quality Assurance
2. "Water Quality Data Presentation and Analysis"
3. Glossary of Water Quality (French-English and English-French, with definitions and examples)

RESOURCES: ($'000)

	Total
TECH.	
PY PROF.	
TOTAL PY	1.00
SALARIES	44.4
O&M	8.0
CONTRACTS	-
CAPITAL	-
TOTAL $	52.4

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT
NUMBER S&IS-2

PROJECT TITLE: WATER QUALITY INTERPRETIVE REPORTS

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

STUDY TEAM: A. Demayo, E. Watt, J. Temple TEL: (819) 997-3423

GOALS:

Preparation and publication of water quality intepretative reports to disseminate information on water quality to resource managers, consultants and the general public.

RATIONALE:

In the last several years the issue of water quality has come to the forefront of resource and environmental management aspects of Canadian society. In this context the water quality interpretative reports have an important role in bringing the data collected to the resource managers in a form which can be used in the decision making process. In addition, the reports inform the Canadian public about the state of water resources in the country.

DESCRIPTION:

Included in the 1986/1987 are the following projects:

1. Publication of the New Brunswick interpretive report.
2. A report on physical parameters, hardness and major ions in important river basins of Canada.
3. Reports on nutrients and metals in Canadian surface waters.

RESOURCES: ($'000)

	Total
TECH.	
PY PROF.	
TOTAL PY	1.40
SALARIES	62.1
O&M	9.0
CONTRACTS	-
CAPITAL	15.0
TOTAL $	86.1

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT NUMBER S&IS-3

PROJECT TITLE: FIELD SAFETY PROCEDURES AND RESEARCH NEEDS

NATIONAL PROGRAM NAME: Water Quality Management Data **C&P CODE:** 1.3

GOALS:
Improve the effectiveness, efficiency and the safety of operations in the Water Quality Branch.

RATIONALE:
To enable the Branch to carry out its mandate and to respond to increased demands for water quality information and advice while the financial and human resources are limited improving effectiveness and efficiency of operations and insuring their safety is an important objective for WQB's management.

DESCRIPTION:
1. Prepare WQB Field Emergency Procedures and submit them for formal approval to Treasury Board.
2. Participate in the research-operations liaison.
3. Review water quality documents and prepare correspondence.

RESOURCES: ($'000)

	Total
TECH.	
PY PROF.	
TOTAL PY	0.3
SALARIES	13.3
O&M	2.0
CONTRACTS	-
CAPITAL	-
TOTAL $	15.3

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT
NUMBER S&IS-4

PROJECT TITLE: WATER QUALITY BRANCH ANNUAL PUBLICATIONS

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

STUDY TEAM: J. Temple, A. Demayo TEL: (819) 953-1555

GOALS:
Dissemination of information about the projects planned in the WQB for the FY 1986/87 and the reports published in 1985.

RATIONALE:
To increase the efficiency, effectiveness and to document its operations and output WQB has been publishing on an annual basis a report describing ongoing projects, and a list of publications authored by WQB's staff.

DESCRIPTION:
The following reports will be compiled:

1. WQB Activities 1986/87.
2. List of Publications 1985.
3. Revise or prepare new regional and headquarters leaflet as needed.

RESOURCES: ($'000)

	Total
TECH.	
PY PROF.	
TOTAL PY	0.4
SALARIES	17.7
O&M	6.0
CONTRACTS	-
CAPITAL	-
TOTAL $	23.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT
NUMBER DS-1

PROJECT TITLE: NAQUADAT - NATIONAL WATER QUALITY DATA BASE

NATIONAL PROGRAM NAME Water Quality Management Data C&P CODE: 1.3

STUDY TEAM: M. Lamb, M. Charette, P. Beaudouin TEL: (819) 953-1556

GOALS:

To effectively archive, manage and disseminate Water Quality Branch data.

RATIONALE:

FPSIW Article 9 and support for all other WQB activities.

DESCRIPTION:

This project encompasses the basic core services of NAQUADAT - the continuing updating, maintaining and improving of the water quality data base. It includes safeguarding and managing all WQB analytical results and the management of the Dictionary file of parameters, as well as the five System 2000 data bases. It includes the provision of information and other aspects of electronic data processing of results. It covers training, program development and documentation as well as Novel EDP applications such as developing prototype databases, new computer programs and colour graphics routines.

RESOURCES: ($'000)

	Total
TECH. PY PROF.	
TOTAL PY	2.0
SALARIES	85.3
O & M	40.00
CONTRACTS	
CAPITAL	15.0
TOTAL $	140.3

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT NUMBER DS-2

PROJECT TITLE: MANUALS, GUIDELINES AND OTHER PUBLICATIONS

NATIONAL PROGRAM NAME: Water Quality Management Data **C&P CODE:** 1.3

STUDY TEAM: M. Lamb, M. Charette, P. Beaudouin TEL: (819) 953-1556

GOALS:

To provide scientific information and advice on water quality.

RATIONALE:

Documentation and dissemination of the work done in the Water Quality Branch and the results obtained are considered integral parts of the Branch programs. See also "Water Quality Branch - Objectives and Programs" paper.

DESCRIPTION:

The following publications are scheduled for 1986/87:

1. Annual NAQUADAT Dictionary of Parameter codes
2. Publication of new NAQUADAT Users Reference Manual

RESOURCES: ($'000)

	Total
TECH. PY PROF.	
TOTAL PY	0.3
SALARIES	12.9
O & M	9.0
CONTRACTS	-
CAPITAL	-
TOTAL $	21.9

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT NUMBER DS-3

PROJECT TITLE: FEDERAL-PROVINCIAL AGREEMENT ON DATA MANAGEMENT

NATIONAL PROGRAM NAME Water Quality Management Data **C&P CODE:** 1.3

STUDY TEAM: M. Lamb, M. Charette, P. Beaudouin TEL: (819) 953-1556

GOALS:

To archive and provide data on water quality in accordance with federal/provincial agreements.

RATIONALE:

Data management is an integral part of the federal-provincial agreements.

DESCRIPTION:

The comparability of federal and provincial data management techniques will be evaluated and the mechanisms and costs of timely data exchange and storage will be determined. Computer programs will be prepared to transfer data between provincial signatories and NAQUADAT. The performance target for data exchange is to be able to verify and store 50% of the data received from cooperating provincial agencies within two weeks and to be able to transfer 90% of federal data requested by a province within a similar period.

RESOURCES: ($'000)

	Total
TECH. PY PROF.	
TOTAL PY	0.7
SALARIES	29.9
O & M	6.0
CONTRACTS	-
CAPITAL	-
TOTAL $	35.9

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT NUMBER DS-4

PROJECT TITLE: INTERPRETATION AND PRODUCTION OF DATA REPORTS

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

STUDY TEAM: M. Lamb, M. Charette, P. Beaudouin TEL: (819) 953-1556

GOALS:

To produce data and interpretative reports on water quality conditions which further understanding of the aquatic environment.

RATIONALE:

FPSIW Article 9 - Provision of information, advice and analysis.

DESCRIPTION:

A detailed data report will be produced for Newfoundland, Alberta, Saskatchewan, Manitoba and Northwest Territories as well as for the PPWB report and and other studies. This project is used to cover costs and efforts associated with data analysis for WQB. This would include computer work associated with interpretative studies, noncompliance reporting and other requests for data processing.

RESOURCES: ($'000)

	Total
TECH. PY PROF.	
TOTAL PY	0.3
SALARIES	12.9
O & M	4.0
CONTRACTS	-
CAPITAL	-
TOTAL $	16.9

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT NUMBER DS-5

PROJECT TITLE: GLOBAL ENVIRONMENTAL MONITORING SYSTEM

NATIONAL PROGRAM NAME: Water Quality Management Data C&P CODE: 1.3

STUDY TEAM: M. Lamb TEL: (819) 953-1556

GOALS:
To coordinate the Canadian input to the GEMS/WATER monitoring scheme.

RATIONALE:
The Global Environmental Monitoring System (GEMS) began as an outcome of the United Nations Conference on the Human Environment held in Stockholm in June 1972. The water component (GEMS/Water) of this project is a joint UNESCO and WHO operation which attempts to monitor long-term trends in water pollution of a selected numbers of rivers, lakes and ground water around the world. The purpose of the monitoring is to detect any serious deterioration of the environment as a result of the introduction of man-made pollutants, and to provide advance warning to mankind. Under the program a global network of monitoring stations has been established and uniform methods of sampling and analysis are being promoted. The data from the world-wide monitoring program is managed in the GLOWDAT database facility at the Canada Centre for Inland Waters.

DESCRIPTION:
The Water Quality Branch provides the Canadian input to the GEMS program. Data from selected rivers and lakes are forwarded periodically from NAQUADAT to the GLOWDAT data handling system. The GEMS requirements are met through regular WQB monitoring but with a commitment to maintain on-going monitoring at the 13 sites designated for the global program. Additionally, the WQB provides support and advice for GLOWDAT data management as requested by the Collaborating Centre at NWRI, as well as expert advice on project reviews and evaluation of the entire GEMS program.

A recent evaluation of the GEMS/WATER data has suggested changes required to the monitoring scheme. The WQB will adapt to respond to identified needs.

RESOURCES: ($'000)

	Total
PY TECH. PROF.	
TOTAL PY	0.1
SALARIES	4.0
O & M	1.0
CONTRACTS	-
CAPITAL	-
TOTAL $	5.0

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT
NUMBER DIR-1

PROJECT TITLE: WQB - MANAGEMENT AND ADMINISTRATION

NATIONAL PROGRAM NAME: Management and Administration C&P CODE: 1.6

STUDY TEAM: Director's Office TEL: (819) 997-1920

GOALS:

Ensure effective and efficient Management of all aspects of Water Quality Branch HQ.

Provisions of Policy, Direction and Advice to IWD and the Water Quality Branch.

RATIONALE: Develop and administrate policies, programs, and activities of WQB-HQ and provide functional direction to the WQB regional offices in an active and efficient manner.

DESCRIPTION: Provision of policy, advice and guidelines to regional offices in the conduct of Water Quality Branch activities including monitoring and surveys, laboratory operations, data storage and retrieval, data interpretation, water quality objectives, and research coordination.

Provision of information and advice to the DG-IWD and ADM-C&P as well as other federal officials on aquatic environmental issues.

Timely completion of Budget Year Work plans in February 1986. Timely completion of succesion plans. Mid-year third quarter and year-end performance reports in April 1985 and January 1986. Completion of Long Term Operational Plans in December 1985. Training and development plan by January 1986.

Completion of all administration and financial reports in advance of due date.

Staff appraisals completed by March, 1985.

RESOURCES: ($'000)

	Total
TECH. PY PROF.	4.6
TOTAL PY	4.6
SALARIES	183.4
SALARY RESERVE	138.6
O & M	77.0
CONTRACTS	-
CAPITAL	5.0
TOTAL $	404.0

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT
NUMBER S.Adv.-1

PROJECT TITLE: ADVICE - CANADA-U.S. WATER QUALITY

NATIONAL PROGRAM NAME: Canada-U.S. and Interjurisdictional Water Management

C&P CODE: 1.6

STUDY TEAM: J. Fitzpatrick

Tel: (819) 997-1921

GOALS:

1. Provide a centre within the WQB for effectively responding to and acting for ECS Senior Management on boundary waters issues.
2. To provide information Senior Management on Great Lakes boundary water problems under review by the Great Lakes Water Quality Board (IJC)SO.
3. To assist in negotiations with the U.S. on acceptable PO_4 loadings to the Great Lakes and acceptable allocations to each of the parties.
4. To provide the Director, WQB, headquarters with advice on the operational activities of the Water Quality Branch.
5. To provide secretariat service to the Water Quality Subcommittee of the Interdepartmental Committee on Water for ICW.

RATIONALE:
Resolve interjurisdictional water resource problems and realize interjurisdictional water resource opportunities in accordance with national interests.

DESCRIPTION:
Provide expert advice and guidance to DG, ADM and other senior staff.

RESOURCES: ($'000)

	Total
TECH.	
PY PROF.	0.8
TOTAL PY	0.8
SALARIES	49.6
O & M	4.0
CONTRACTS	-
CAPITAL	-
TOTAL $	53.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT
NUMBER DIR-2

PROJECT TITLE: MANAGEMENT OF IWD TOXIC CHEMICALS PROGRAM

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

STUDY TEAM: Director's Office

Tel: (819) 997-1920

GOALS:

Effective and efficient management of IWD Toxic Chemicals program.

RATIONALE:

Toxic Chemicals is high priority program in DOE and IWD is an important contribution to it. The increasing need for information on the effects of toxic chemicals on the aquatic environment combined with limited resources require effective and efficient management to achieve the program goals.

DESCRIPTION:

Recommend policies and priorities, review plans and resource allocation, and evaluate results.

RESOURCES: ($'000)

	Total
TECH.	
PY PROF.	0.2
TOTAL PY	0.2
SALARIES	7.00
O & M	4.00
CONTRACTS	-
CAPITAL	-
TOTAL $	11.00

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/1987

REGION/HQ HQ
PROJECT NUMBER S&IS-5

PROJECT TITLE: TOXIC CHEMICALS IN CANADIAN SURFACE WATERS

NATIONAL PROGRAM NAME Toxic Chemicals

C&P CODE: 4.1

STUDY TEAM: A. Demayo

TEL: (819) 997-3423

GOALS:

1. Develop an all-weather precipitation sampler to collect samples for analysis of organic compounds (in collaboration with NWRI).
2. Implement new Radionuclides Monitoring Program.
3. Prepare a report on "Metals in Surface Waters of Canada".
4. Development of Toxic Chemical Monitoring Program under Federal/Provincial Agreements.

RATIONALE:

Toxic Chemicals is a high priority program in Environment Canada and the WQB is responsible for providing the information related to the quality of the aquatic environment.

DESCRIPTION:

1. Build new prototype precipitation sampler (in collaboration with NWRI).
2. Prepare specifications for the construction of additional samplers.

RESOURCES: ($'000)

	Total
TECH. PY PROF.	
TOTAL PY	3.5
SALARIES	160.0
O&M	15.0
CONTRACTS	-
CAPITAL	15.0
TOTAL $	190.0

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION HQ
PROJECT NO. OBJ-3

PROJECT TITLE: WATER QUALITY GUIDELINES FOR PESTICIDES

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURATION: On-going

STUDY TEAM: M.C. Taylor, personnel to be hired

TEL: (819) 997-1920

GOALS: 1. Develop water quality guidelines for pesticides, in consultation with Agriculture Canada.

RATIONALE: The project is part of the IWD Pesticides Plan

DESCRIPTION:

A new employee will be hired under the IWD Pesticides Plan to develop water quality guidelines for pesticides. The pesticides will be selected in consultation with the CCREM Task Force on Quality Guidelines and Agriculture Canada, and will be part of the re-evaluation of pesticides currently in use.

A-BASE RESOURCES ($'000)

	Total
PY TECH.	
PROF	1.0
TOTAL PY	1.0
SALARIES	43.7
O&M	11.0
CONTRACTS	
CAPITAL	
TOTAL	54.7

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION HQ
PROJECT NO. OBJ-4

PROJECT TITLE: CANADIAN WATER QUALITY GUIDELINES

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURATION: Publication of the Canadian Water Quality Guidelines in January 1987. Revision and updating will be on-going.

STUDY TEAM: M.C. Taylor, R.C. Pierce, K. Thibault, A.R. Davis and regional staff.

TEL: (819) 997-1922

GOALS:

1. Prepare final draft of the Guidelines for presentation to the CCREM annual meeting (October 1986).
2. Publish the Guidelines in January 1987 after CCREM approval.
3. Present report on research needs to CCREM in October 1986, publish later.

RATIONALE: The CCREM has requested the WQB to chair the task force and to coordinate preparation of the Guidelines.

DESCRIPTION:

In September 1984 the CCREM, accepting a recommendation of the Task Force on Water Guidelines, requested the task force to develop Canadian Water Quality Guidelines and to present the final draft at its October 1986 meeting. The task force was also asked to present a report on research needs.

Environment Canada (WQB) offered to coordinate the project, and the editing is being done by HQ staff with help from regional objectives personnel, other federal departments and provincial members of the task force.

A-BASE RESOURCES ($'000)

	Total
PY TECH.	
PROF	3.0
TOTAL PY	3.0
SALARIES	131.5
O&M	34.0
CONTRACTS	
CAPITAL	
TOTAL	165.5

PROJECT DESCRIPTION
WATER QUALITY BRANCH - 1986/1987

REGION HQ
PROJECT NO. OBJ-5

PROJECT TITLE: TOXIC CHEMICALS ADVICE AND INFORMATION

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURATION: On-going

STUDY TEAM: A.R. Davis, D. McGirr, K. Thibault

TEL: (819) 997-1922

GOALS:

1. Provide information and advice on toxics to IWD Director and DOE management.
2. Report on utilization of IWD pesticide resources and priorities for 87/88.
3. Represent DOE on Federal-Provincial Drinking Water Guidelines Committee.

RATIONALE: This project is part of the DOE Toxic Chemicals Program.

DESCRIPTION:

This project covers miscellaneous activities and requests for advice and information related to the DOE Toxic Chemicals Program.

A-BASE RESOURCES ($'000)

	Total
PY TECH.	
PROF	0.15
TOTAL PY	0.15
SALARIES	6.3
O&M	2.0
CONTRACTS	
CAPITAL	
TOTAL	8.3

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT
NUMBER DS-6

PROJECT TITLE: DATA MANAGEMENT - TOXIC SUBSTANCES

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

STUDY TEAM: M. Lamb, M. Charette, P. Beaudouin

TEL: (819) 953-1556

GOALS:
To effectively archive, manage and disseminate information on toxic substances measured by the Water Quality Branch so as to be able to classify toxic substances and indicate environmental levels throughout Canada.

RATIONALE:
The pervasiveness of toxic chemicals and the high priority placed on their assessment and control require that monitoring data be readily available for inspection and analysis. The NAQUADAT data system serves as the repository for this information.

DESCRIPTION:
Toxic chemicals will be classified in the NAQUADAT Dictionary of parameters and monitoring results will be entered onto the appropriate NAQUADAT data base. All requests for information will be handled expeditiously. A prototype data base for biological media will be established. A report on metal data is planned expeditiously.

RESOURCES: ($'000)

	Total
TECH. PY PROF.	
TOTAL PY	1.5
SALARIES	62.6
O & M	15.0
CONTRACTS	-
CAPITAL	-
TOTAL $	77.6

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT NUMBER S&IS-6

PROJECT TITLE: SURFACE WATER MONITORING FOR LRTAP ASSESSMENT

NATIONAL PROGRAM NAME: Long Range Transport of Airborne Pollutants

C&P CODE: 4.2

STUDY TEAM: P. Brooksbank

TEL: (819) 953-1554

GOALS:
To develop, implement and coordinate a surface water monitoring network for Canada, capable of defining rates of changes in aquatic regime major ion and trace metal content.

RATIONALE:
Long range atmospheric transport has been identified as a very important pathway be which various pollutants reach aquatic ecosystems. LRTAP is a priority in DOE.

DESCRIPTION:
The network will provide good quality assured data suitable for assessing the long-term trends in water quality related to the LRTAP Program. The network has ben in operation since April 1983 and is starting to produce results. More emphasis will be put into assessing these preliminary data.

RESOURCES: ($'000)

	Total
PY TECH.	
PY PROF.	1.2
TOTAL PY	1.2
SALARIES	52.0
O & M	6.0
CONTRACTS	15.0*
CAPITAL	-
TOTAL $	73.0

* non A-base resources

PROJECT DESCRIPTION
WATER QUALITY BRANCH
1986/87

REGION/HQ HQ
PROJECT
NUMBER S&IS-7

PROJECT TITLE: NAQUADAT DATA BASE MANAGEMENT

NATIONAL PROGRAM NAME: Long Range Transport of Airborne Pollutants

C&P CODE: 4.2

STUDY TEAM: P. Brooksbank

TEL: (819) 953-1554

GOALS:
To update and maintain a national data base related to the long range transport of airborne pollutants.

RATIONALE:
FPSIW Article 9. High priority departmental program.

DESCRIPTION:
Data from the LRTAP water quality monitoring sites, and othe water quality data useful to the LRTAP program will be added to the NAQUADAT Data Base. This data will be inventoried and made available as requested.

RESOURCES: ($'000)

	Total
TECH.	
PY PROF.	0.3
TOTAL PY	0.3
SALARIES	13.0
O & M	4.0
CONTRACTS	5.0*
CAPITAL	-
TOTAL $	22.0

* non A-base resources

NATIONAL LABORATORY
LABORATOIRE NATIONALE

PROJECT DESCRIPTION

WATER QUALITY BRANCH - 1986-1987

REGION HQ
PROJECT NO. LAB-1

PROJECT TITLE: ANALYTICAL SERVICES ENVIRONMENTAL PARAMETERS

NATIONAL PROGRAM NAME: Water Quality Management Data

C&P CODE: 1.3

DURATION: On-going

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan

TEL: (416) 336-4648

GOALS:

1. To provide a national analytical support service to inter-departmental agencies.
2. To maintain analytical capabilities for complex chemical and physical analyses on a wide variety of water, waste water, precipitation, sediment, biota and other substrates related to the aquatic ecosystem in support of studies related to environmental management and protection and related research.

RATIONALE:

As part of the ECS mandate for the generation of physical, chemical and biological environmental data in relation to the Canada Water Act, Canada/U.S. Water Quality Agreement, Fisheries Act, Environmental Contaminants Act and the Federal Policy Statement on Inland Waters.

DESCRIPTION:

Provision of direct analytical services to the following activities:

- Programs of the five Water Quality Branch regions across Canada.
- NWRI research projects.
- Great Lakes Water Quality program.
- Operation of the ship board laboratory to analyse Great Lakes waters.
- Atmospheric Environmental Services precipitation program.
- Environmental Protection Services program.
- GLFRB research and monitoring projects.

A-BASE RESOURCES ($'000):

	A-Base	Cost Recoverable	TOTAL
PY TECH.			
PROF.			
TOTAL PY	23.0		23.0
SALARIES	690.0		690.0
O & M	270.0	3.0	273.0
CONTRACTS			
CAPITAL	136.5	-	136.5
TOTAL	1096.5	3.0	1099.5

PROJECT DESCRIPTION

WATER QUALITY BRANCH - 1986-1987

REGION HQ
PROJECT NO. LAB-2

PROJECT TITLE: ANALYTICAL SERVICES-FEDERAL/PROVINCIAL AGREEMENTS

NATIONAL PROGRAM NAME: Water Quality Management data C&P CODE: 1.3

DURATION: On-going

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan TEL: (416) 336-4648

GOALS:

1. Provide analytical support service to Water Quality Monitoring Agreements.
2. To maintain analytical capabilities for complex Physical and Chemical analyses related to the aquatic eco-system.

RATIONALE:

There is a requirement to provide analytical support to negotiated Water Quality Monitoring Agreements with the Provinces.

DESCRIPTION:

Provision of direct analytical services to support signed Federal/Provincial Monitoring Agreements.

A-BASE RESOURCES ($'000):

	Total
PY TECH.	
PROF.	8.0
TOTAL PY	8.0
SALARIES	240.0
O & M	
CONTRACTS	-
CAPITAL	-
TOTAL	240.

PROJECT DESCRIPTION

WATER QUALITY BRANCH - 1986-1987

REGION HQ
PROJECT NO. LAB-3

PROJECT TITLE: ANALYTICAL SERVICES - TOXIC SUBSTANCES

NATIONAL PROGRAM NAME: Toxic Chemicals

C&P CODE: 4.1

DURATION: On-going

STUDY TEAM: Project Coordinator - Dr. B.K. Afghan

TEL: (416) 336-4648

GOALS:

1. To provide a national analytical support service.
2. To maintain complex analytical methodology on organic and inorganic toxic substances on a wide variety of water, waste water, precipitation, sediment, biota and other related aquatic substrates in support of toxic substances studies carried out by environmental agencies.

RATIONALE:

As part of the ECS mandate for the generation of physical chemical and biological environmental data in relation to the Canada Water Act, Canada/U.S. Water Quality Agreement, Fisheries Act, Environmental Contaminants Act and the Federal Policy Statement on Inland Waters.

DESCRIPTION:

Provision of direct analytical services to the following activities:

- Programs of the five Water Quality Branch regions across Canada.
- NWRI research projects.
- Great Lakes Water Quality program.
- Operation of the ship board laboratory to analyse Great Lakes waters.
- Atmospheric Environmental Services precipitation program.
- Environmental Protection Services program.
- GLFRB research and monitoring projects.

A-BASE RESOURCES ($'000):

	Total
PY TECH.	
PROF.	
TOTAL PY	12.0
SALARIES	360.0
O & M	117.15
CONTRACTS	
CAPITAL	35.0
TOTAL	512.15